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Admiral	CA2215Z, CA2216Z, CA2217Z, CA2236, CA2237, CA2246, HA2216Z, HA2217Z, KA2216, KA2217, KA2226, KA2227, LA2215Z, LA2216Z, LA2217Z, TA1811, TA1812, TA1822, TA2211, TA2212, TA2215, TA2216, TA2217, TA2218, TA2222, TA2226, TA2242 (Ch. 19L2, 19L2Z, 19M2, 19N2Z, 19S2, 19T1, 19T1C, 19W1, 19W1A, 19W1B, 19W1C, 19Y1A) Tel. Rec.	266-1
Arvin	21-550KB, KBU, KM, KMU, 21-551TB, TBU, TM, TMU, 21-552KB, KBU, KM, KMU, 21-553TB, TBU, TM, TMU (Ch. TE379, TE382) Tel. Rec.	266-2
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Westinghouse	H-475T5, H-476T5, H-477T5, H-478T5 (Ch. V-2236-1)	266-20

PHOTOFACT* Folder

*TRADE MARK

RETMA MEMBER

ADMIRAL CHASSIS 19L2, 19L2Z, 19M2, 19N2Z, 19S2, 19T1, 19T1C, 19W1, 19W1A, 19W1B, 19W1C, 19Y1A

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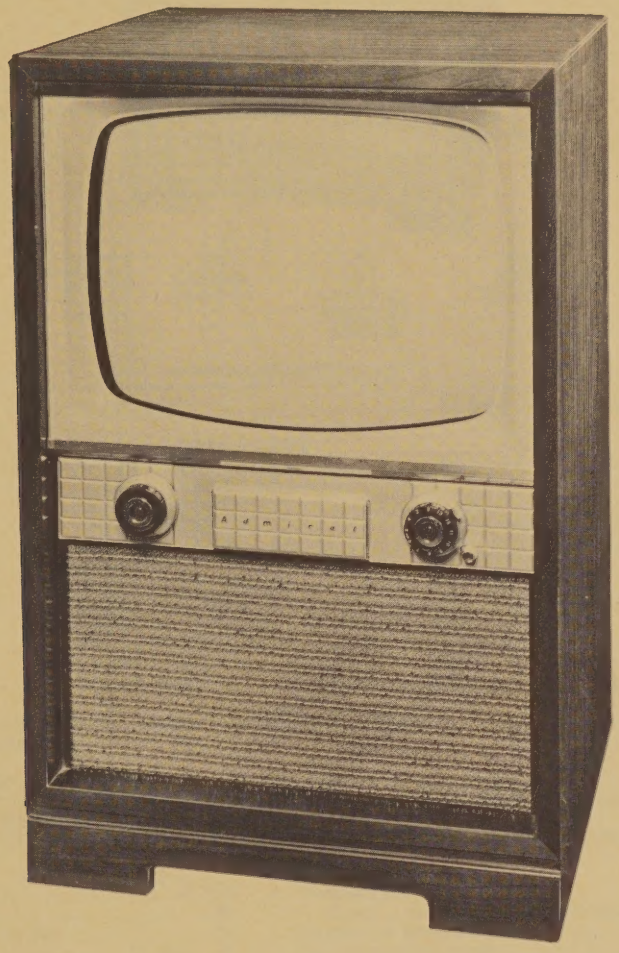

MODEL CA2246

ADMIRAL CHASSIS 19L2, 19L2Z, 19M2, 19N2Z, 19S2, 19T1, 19T1C, 19W1, 19W1A, 19W1B, 19W1C, 19Y1A

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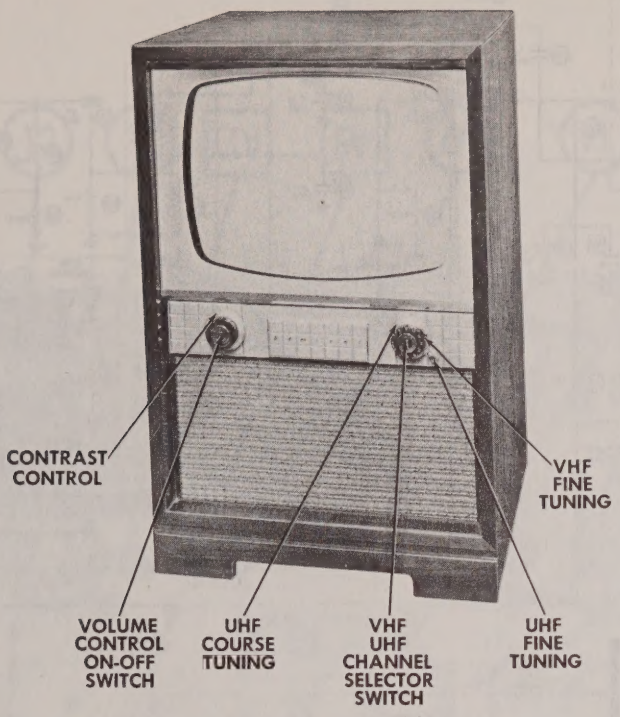

ADMIRAL MODEL CA2246

TRADE NAME	ADMIRAL	MODELS	CHASSIS	RADIO
		CA2236, CA2237, TA2215, TA2216, TA2217, TA2218	19L2	
		CA2215Z, CA2216Z, CA2217Z HA2216Z, HA2217Z	19L2Z	
		KA2216, KA2217	19M2	2 tube built-in
		LA2215Z, LA2216Z, LA2217Z	19N2Z	3D1 (AM only)
		TA2242	19S2	
		TA1811, TA1812, TA1822	19T1, 19T1C	
		TA2222	19W1, 19W1C	
		TA2226	19W1	
		TA2211, TA2212	19W1A, 19W1B	
		CA2246	19W1B	
		KA2226, KA2227	19Y1A	2 tube built-in

MANUFACTURER	Admiral Corp., 3800 W. Cortland St., Chicago 47, Illinois
TYPE SET	Television Receiver
TUBES	Twenty
POWER SUPPLY	110-120 Volts AC- 60 Cycles RATING 1.64 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound 41.25MC (Intercarrier) AM Radio 535-1620KC, AM IF 455KC

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FOR SERVICE INFORMATION ON RECORD CHANGER SEE ADMIRAL MODEL RC600, PHOTOFACT SET 218, FOLDER 2 OR RECORD CHANGER MANUAL CM-5.

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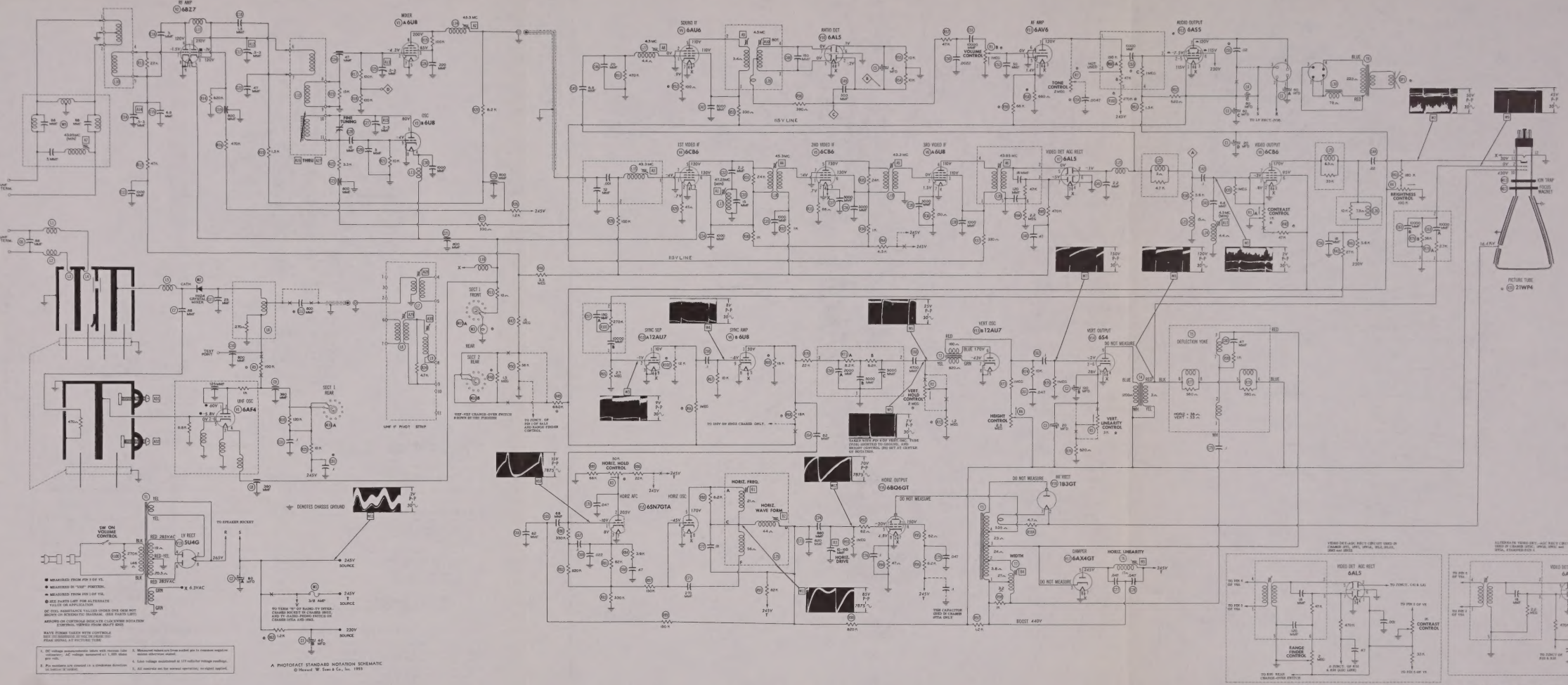
ADMIRAL CHASSIS 19L2, 19L2Z, 19M2, 19N2Z, 19S2, 19T1, 19T1C, 19W1, 19W1A, 19W1B, 19W1C, 19Y1A



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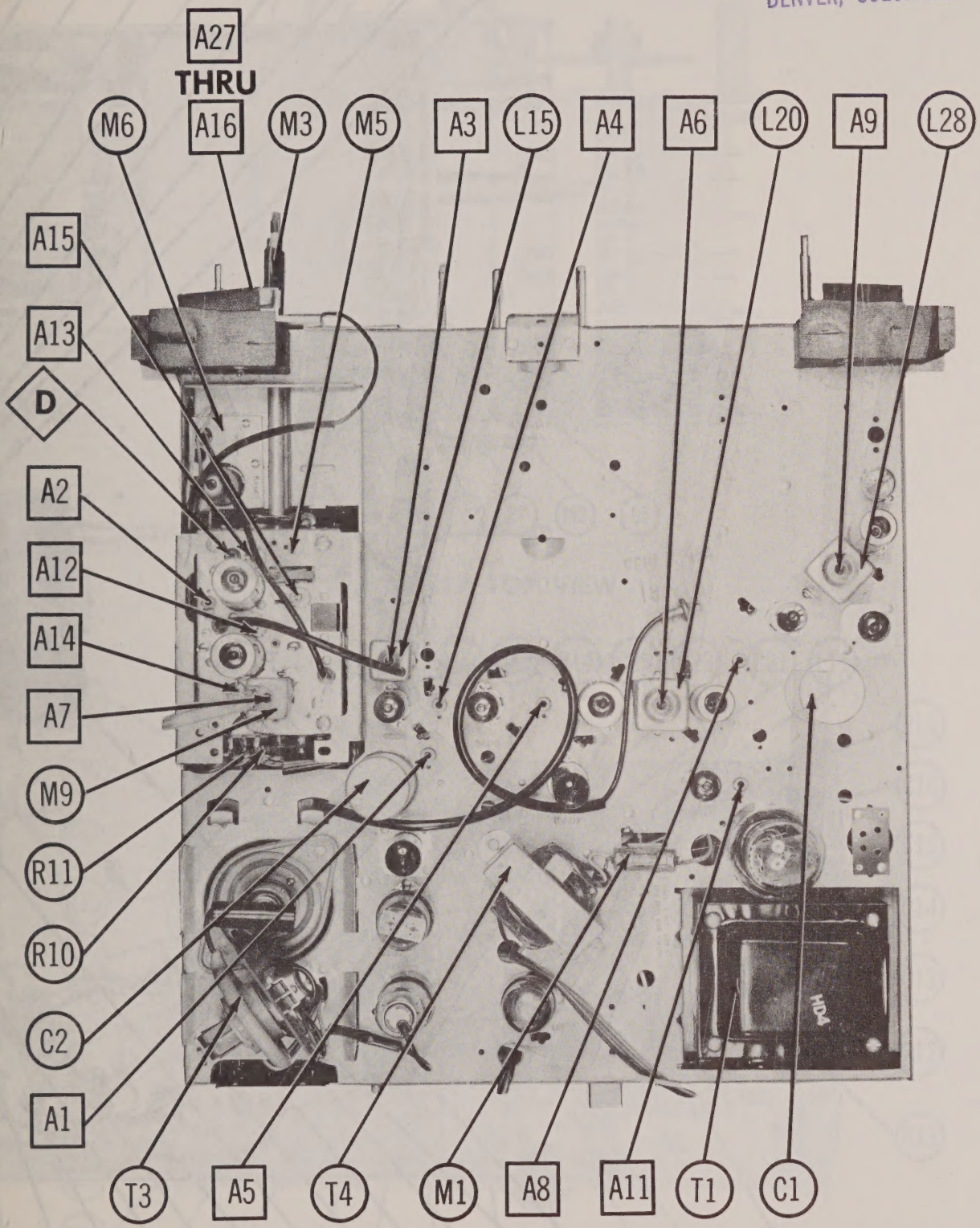
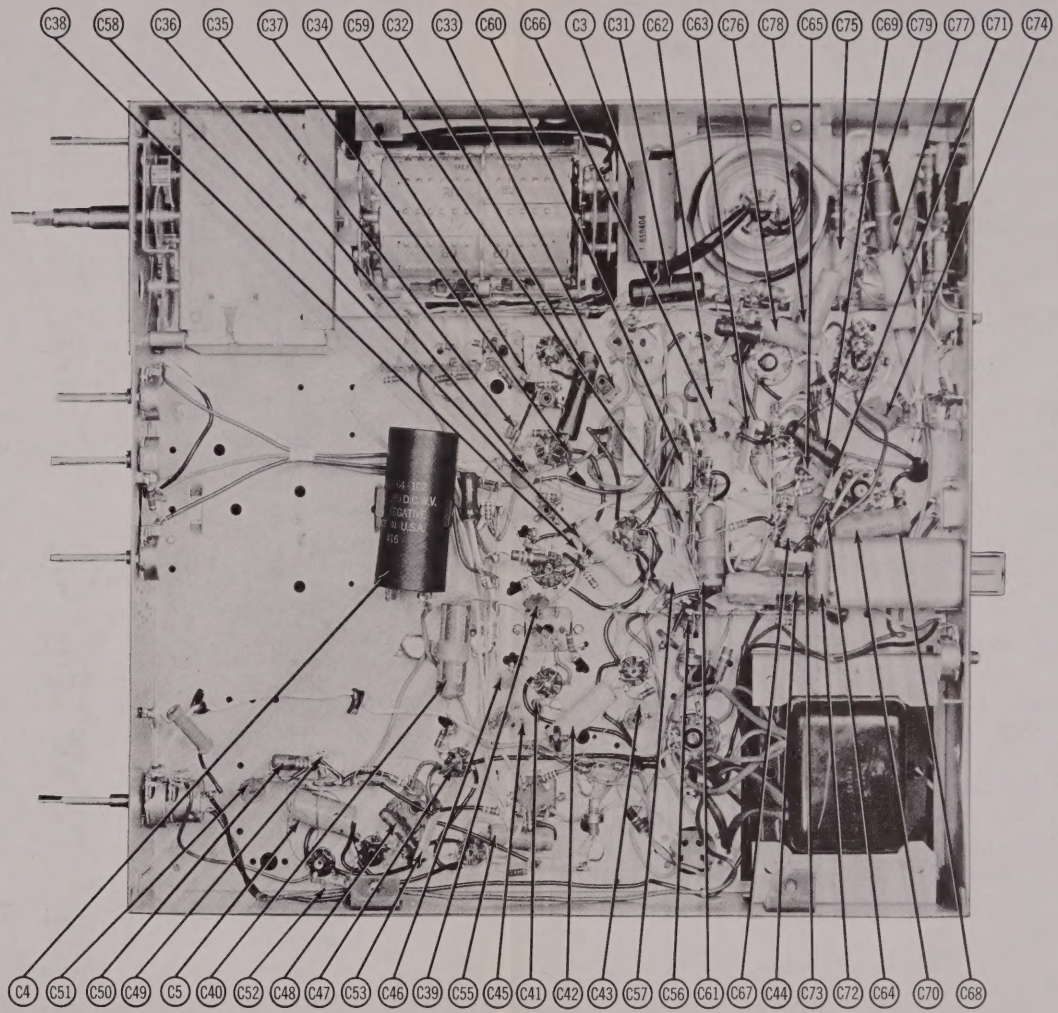


CHASSIS TOP VIEW

SET 266 FOLDER 1

ADMIRAL CHASSIS 19L2, 19L2Z, 19M2, 19N2Z, 19S2, 19T1, 19T1C, 19W1, 19W1A, 19W1B, 19W1C, 19Y1A



CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

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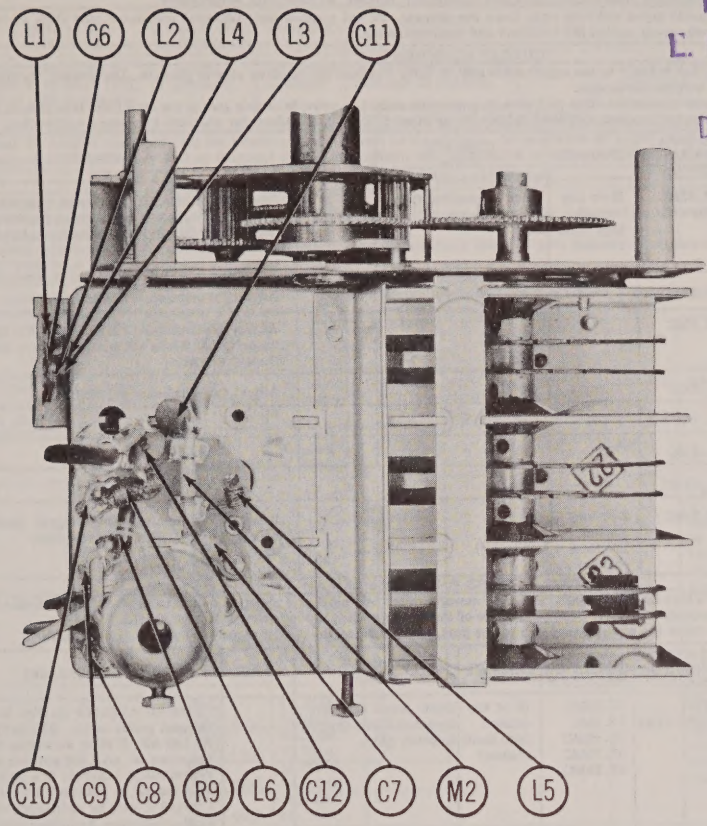
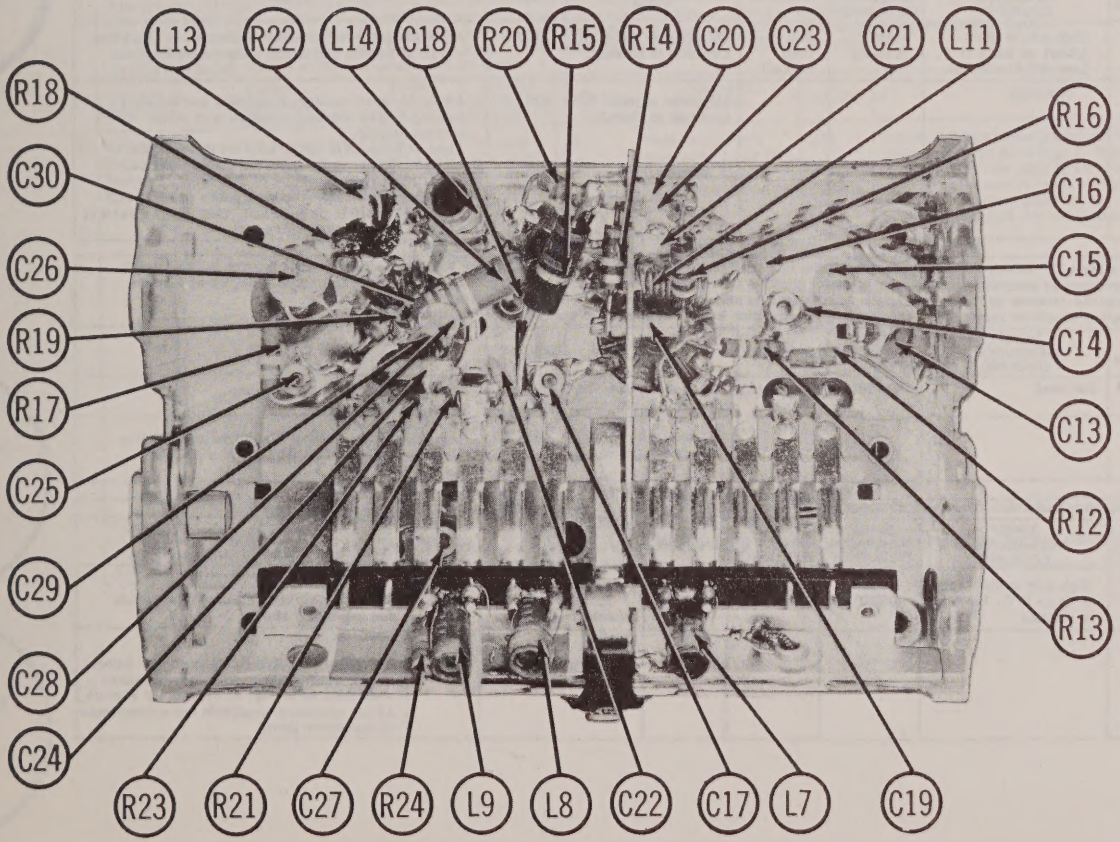


UHF TUNER TOP VIEW



VHF TUNER-BOTTOM VIEW

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage lead should be securely taped and kept away from the chassis. Do not remove the horizontal oscillator tube (V15) to disable the high voltage. Allow a 15 minute warm-up period for receiver and test equipment.

VIDEO IF ALIGNMENT

Connect the negative lead of a 4.5 volt bias battery to the ungrounded side of C35. Connect the positive side to chassis. Disconnect the antenna lead-in and connect a short jumper across the antenna terminals.
Set the contrast control maximum counter clockwise. Use only enough generator output to provide usable indication on VTVM (use lowest DC scale).
Signal generator to be used should be checked against a crystal calibrator or other frequency standard for absolute frequency calibration.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to ungrounded tube shield floating over converter tube (V3). Low side to tuner chassis near V3.	47.25MC (Unmod)	13 or any unused high band channel	Thru decoupling filter (Fig.J) to point A.	A1	Preset A2 and A3 fully counter clockwise. Attenuate generator output to maintain not more than 1 volt at VTVM. Adjust A1 for MINIMUM deflection.
2.	"	"	45.3MC	"	"	A2	Adjust for maximum deflection.
3.	"	"	43.3MC	"	"	A3	Adjust for maximum deflection. This is a temporary adjustment. Final adjustment occurs in step 4. Repeat step 2.
4.	"	"	45.3MC	"	"	A3	Adjust for maximum deflection.
5.	"	"	"	"	"	A4	"
6.	"	"	43.3MC	"	"	A5	"
7.	"	"	43.95MC	"	"	A6	"
8.	"	Across antenna terminals.	43.95MC	2 or any unused low band channel	"	A7	If necessary, use maximum signal generator output. Adjust A7 for MINIMUM deflection. Repeat steps 1 and 5.

OVERALL VIDEO IF RESPONSE CHECK

Leave bias battery connected as under "Video IF Alignment". Use only enough sweep and marker generator output to provide usable indication on scope.
If a separate marker generator is used couple it loosely to the high side of the sweep generator output lead on tube shield.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	Direct	High side to ungrounded tube shield floating over converter tube (V3). Low side to tuner chassis near V3.	44MC (10MC Swp)	41.25MC 42.0MC 43.95MC 45.75MC 47.25MC	13 or any unused high band channel	Vert. Amp. thru decoupling filter (Fig.J) to point A.		Check for response similar to Fig. 2. If unequal peaks occur, SLIGHTLY retouch A2 and A3. If after adjusting A2 and A3 response is still not similar to Fig.2, repeat steps 1 thru 9. If a suitable response still cannot be obtained after repeating steps 1 thru 9 it may be necessary to check for a defective video amplifier tube or circuit component.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

If a signal generator capable of producing a 4.5MC signal with an accuracy of ±1KC is not available follow the procedure outlined under "Sound IF Alignment Using A TV Signal and VTVM".

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
10.	.01MFD	High side to pin 2 (plate) of 6AL5 (V7). Low side to chassis.	4.5MC (Unmod)	Any unused channel	DC probe to point B. Common to chassis.	A8, A9	Attenuate generator output to maintain not more than -1 volt at VTVM. Adjust for maximum deflection.
11.	"	"	"	"	DC probe to point C. Common to chassis.	A10	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting. Final adjustment of A10 is best made with a TV station tuned in. Adjust A10 for clearest sound, and MINIMUM buzz. Point of MINIMUM buzz should occur between two buzz peaks which should occur when A10 is turned SLIGHTLY in one direction and then in the reverse direction.

SOUND IF ALIGNMENT USING TV SIGNAL AND VTVM

Tune in a local TV station and adjust the signal input into the receiver for approximately -5 volts on VTVM. If signal input is too strong, the signal may be reduced by inserting an attenuator in series with the antenna and antenna terminals. If a suitable attenuator is not available, stray feed the signal into the receiver by disconnecting the antenna lead-in and placing it near the receiver's antenna terminals.
The receiver should be restored to normal operating condition before attempting to tune in a local TV station.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
10.	Not used	Not used	Not used	Any local station	DC probe to point B. Common to chassis.	A8, A9	Adjust for maximum deflection.
11.	"	"	"	"	DC probe to point C. Common to chassis.	A10	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 80% modulation and 450KC sweep. Use 130v sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
10.	.01MFD	High side to pin 2 (plate of 6AL5 (V7). Low side to chassis.	4.5MC (450KC Swp)	4.5MC	Any unused channel	Vert. Amp. to point B. Low side to chassis.	A8, A9	Disconnect stabilizing capacitor C5. Adjust for curve of maximum amplitude and symmetry similar to Fig. 3.
11.	"	"	" "	"	"	Vert. Amp. to point C. Low side to chassis.	A10	Reconnect stabilizing capacitor C5. Adjust so that 4.5MC occurs at center of crossover lines as in Fig. 4. SLIGHTLY retouch A9 for maximum amplitude and straightness of crossover lines.

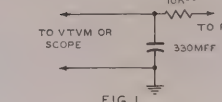


FIG. 1

FIG. 2

FIG. 3

FIG. 4

FIG. 5

FIG 6

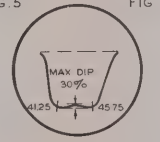


FIG. 7

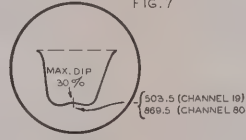


FIG. 8

FIG. 9

4.5MC TRAP ALIGNMENT

Connect a 10MMF capacitor from pin 5 (plate) of 6CB6 (V8) to pin 7 (cathode) of 6AU8 (V9).

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
12.	.01MFD	High side to pin 2 (plate) of 6AL5 (V7). Low side to chassis.	4.5MC (Unmod)	Any unused channel	DC probe to point B. Common to chassis.	A11	Adjust for MINIMUM deflection on lowest DC scale on VTVM.

ALTERNATE 4.5MC TRAP ALIGNMENT

Tune in a local TV station and adjust A11 for minimum 4.5MC beat in the picture. An indication of 4.5MC beat interference in the picture is a gauze-like pattern of very fine vertical or diagonal lines. The pattern will vary as the sound varies forming a very fine herring bone pattern.

RF AND MIXER ALIGNMENT

Leave bias battery connected as under "Video IF Alignment".
If difficulty is experienced in obtaining a response of sufficient amplitude, remove the bias battery from the ungrounded side of C35 and connect a jumper from the ungrounded side of C35 to chassis.
Sweep and marker generator outputs should be attenuated for minimum outputs that will give usable indications on scope. The marker pips should be just barely visible on response curve.
If a separate marker generator is used couple it loosely to the antenna terminals.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
13.	Two 120Ω Carbon Resistors	Across VHF antenna terminals with 120Ω in each lead.	195MC (10MC Swp)	193.25MC 197.75MC	10	Vert. Amp. thru 100KΩ to point D. Low side to chassis.	A12, A13	Adjust for response similar to Fig. 5.
14.	"	"	85MC (10MC Swp)	83.25MC 87.75MC	6	"	A14	"
15.	"	"	213MC (10MC Swp)	211.25MC 215.75MC	13	"		Check for response similar to Fig. 5. If markers fall below 70% on any high band channel, make compromise adjustments of A12 and A13 with channel switch set to that channel. Check all other high band channels to see that they have not been seriously affected.
		207MC (10MC Swp)	205.25MC 209.75MC	12				
		201MC (10MC Swp)	199.25MC 203.75MC	11				
		189MC (10MC Swp)	187.25MC 191.75MC	9				
		183MC (10MC Swp)	181.25MC 185.75MC	8				
		177MC (10MC Swp)	175.25MC 179.75MC	7				
16.	"	"	79MC (10MC Swp)	77.25MC 81.75MC	5	"		Check for response similar to Fig. 5. If markers fall below 70% on any low band channel make compromise adjustment of A14 with channel switch set to that channel. Check all other low band channels to see that they have not been seriously affected.
		67MC (10MC Swp)	65.25MC 69.75MC	4				
		63MC (10MC Swp)	61.25MC 65.75MC	3				
		57MC (10MC Swp)	55.25MC 59.75MC	2				

OSCILLATOR ALIGNMENT

Leave the bias battery connected as under "Video IF Alignment".
Complete oscillator alignment may not be necessary. If the oscillator seems to be off frequency approximately the same amount for a majority of the channels, it may be possible to correct them in one step using A15. It should be noted that A15 is an all channel oscillator circuit adjustment and should not be used to correct any individual channel. If adjustment of A15 will not bring all channels well within the range of the fine tuning control it will be necessary to adjust the channel strip adjustment for each channel that is off frequency. The channel oscillator adjustment screws are reached through a hole just above and slightly to the left of the channel switch shaft.
The correct adjustment screw is accessible through this hole as the channel switch is turned to each channel.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control in the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
17.	Two 120Ω Carbon Resistors	Across VHF antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. Amp. thru decoupling filter (Fig. I) to point A.	A16	Adjust to place video marker at 50% on response curve as in Fig. 6. Sound marker should fall at less than 5% on response. It may be necessary to temporarily increase sweep and marker generator for output and scope gain to view the sound marker.
		207MC (10MC Swp)	205.25MC 209.75MC	12			A17	
		201MC (10MC Swp)	199.25MC 203.75MC	11			A18	
		195MC (10MC Swp)	193.25MC 197.75MC	10			A19	
		189MC (10MC Swp)	187.25MC 191.75MC	9			A20	
		183MC (10MC Swp)	181.25MC 185.75MC	8			A21	
		177MC (10MC Swp)	175.25MC 179.75MC	7			A22	
		85MC (10MC Swp)	83.25MC 87.75MC	6			A23	
		79MC (10MC Swp)	77.25MC 81.75MC	5			A24	
		69MC (10MC Swp)	67.25MC 71.75MC	4			A25	
		63MC (10MC Swp)	61.25MC 65.75MC	3			A26	
		57MC (10MC Swp)	55.25MC 59.75MC	2			A27	

ALTERNATE OSCILLATOR ALIGNMENT

Tune in any local TV station. Set the fine tuning control to its mid-range position. Adjust the oscillator channel strip adjustment for clearest picture and best sound. Repeat procedure for all stations available in the area.

ADMIRAL CHASSIS 19H2, 19H3Z, 19H4Z, 19H5Z, 19H6Z, 19H7, 19H7C, 19H8, 19H8C, 19H9, 19H9C

ALIGNMENT INSTRUCTIONS (cont)

UHF 44MC IF ALIGNMENT

Switch the VHF tuner between channels 5 and 6.
Connect the bias battery as under "Video IF Alignment". Remove crystal cover on top of UHF tuner so that crystal is accessible. Remove the 1N124 crystal from crystal holder. Use only enough sweep and marker generator output to provide usable pattern on scope.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
18.	100Ω Carbon Resistors	High side thru 100Ω to negative clip (clip end nearest front end of tuner) on crystal holder. Low side to UHF tuner chassis.	43.5MC (12MC Swp)	41.25MC 45.75MC	Between channels 5 and 6	Vert. Amp. thru 10KΩ to point ⓓ. Low side to VHF tuner chassis.	A28, A29, A30	Very carefully detune A2 EXACTLY three turns counter clockwise. Adjust A28, A29 and A30 for response similar to Fig. 7. Adjust A28 for maximum amplitude near center of response curve. Alternately adjust A29 and A30 for symmetrical response with proper band width and marker placement as in Fig. 7. Readjust A2 EXACTLY three turns clockwise so that A2 is at its original setting.

UHF TUNER ALIGNMENT

The UHF tuner has been properly aligned at the factory and is very stable. Alignment of this portion of the receiver should seldom be required.
Alignment should not be attempted unless the proper test equipment is available.
If a seperate UHF marker generator is used couple it loosely to the transmission line between the antenna terminals and UHF tuner.
Connect the negative lead of a 1.5 volt battery to the ungrounded side of C35. Connect the positive lead to chassis.
Set the DX Ranger Finder (not used in all sets) to "O" position.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
19.	Two 120Ω Carbon Resistors	Across UHF antenna terminals with 120Ω in each lead.	503MC (12MC Swp)	503.5MC	19 (Approx)	Vert. Amp. thru 10KΩ to point ⓓ. Low side to tuner chassis.	A31	Adjust to place marker in center of response curve as in Fig. 8. If UHF tuner is badly mis-aligned a very low amplitude response or very distorted response may be obtained and it will be necessary to roughly align the preselector. To do this remove the snap fastened bottom cover plate of tuner. Adjust by bending the slotted preselector rotor trimmer segments until a suitable response is obtained. Do not remove top cover of UHF tuner.
20.	"	"	869MC (12MC Swp)	869.5MC	80 (Approx)	"	A32	Adjust to place marker in center of response as in Fig. 8. If necessary bend preselector rotor trimmer segments as in step 19 to obtain. Usable pattern on scope similar to Fig. 8.
21.	"	"	887MC (12MC Swp)	885.25MC 889.75MC	83	"		Remove snap fastened bottom plate of tuner. Adjust both UHF preselector trimmer tabs (located between each of two pairs of slotted rotor plates) by moving tabs up or down until a maximum amplitude response with video and sound markers as shown in Fig. 9 is obtained.

22. Check for response similar to Fig. 9 by switching sweep generator and tuner (see frequency chart) thru all UHF channels from channel 83 down thru channel 14. Where necessary, bend preselector rotor blade segments to obtain proper response always bend the plates while tuning lower in frequency to avoid disturbing the tracking of the sections previously adjusted. A check of the section requiring bending may be made by touching the slotted plates with the bending or knifing tool while observing response on scope. Bend one or both sections if necessary to obtain proper response for that particular channel. Care should be used while bending the slotted rotor plates so as not to disturb the position of the polystyrene damping blocks located beneath the stator line.

ON THE AIR UHF OSCILLATOR ALIGNMENT

UHF oscillator trimmer A31 has the greatest affect on the lower UHF channels while A32 has the greatest affect on the higher UHF channels.
Tune in any UHF channel available and adjust either A31 (for lower channels) or A32 (for higher channels) for best picture and clearest sound.
Check all other UHF channels available in that area adjusting either A31 or A32 for clearest picture and best sound.

RADIO TUNER ALIGNMENT (USED ON 19M2 CHASSIS)

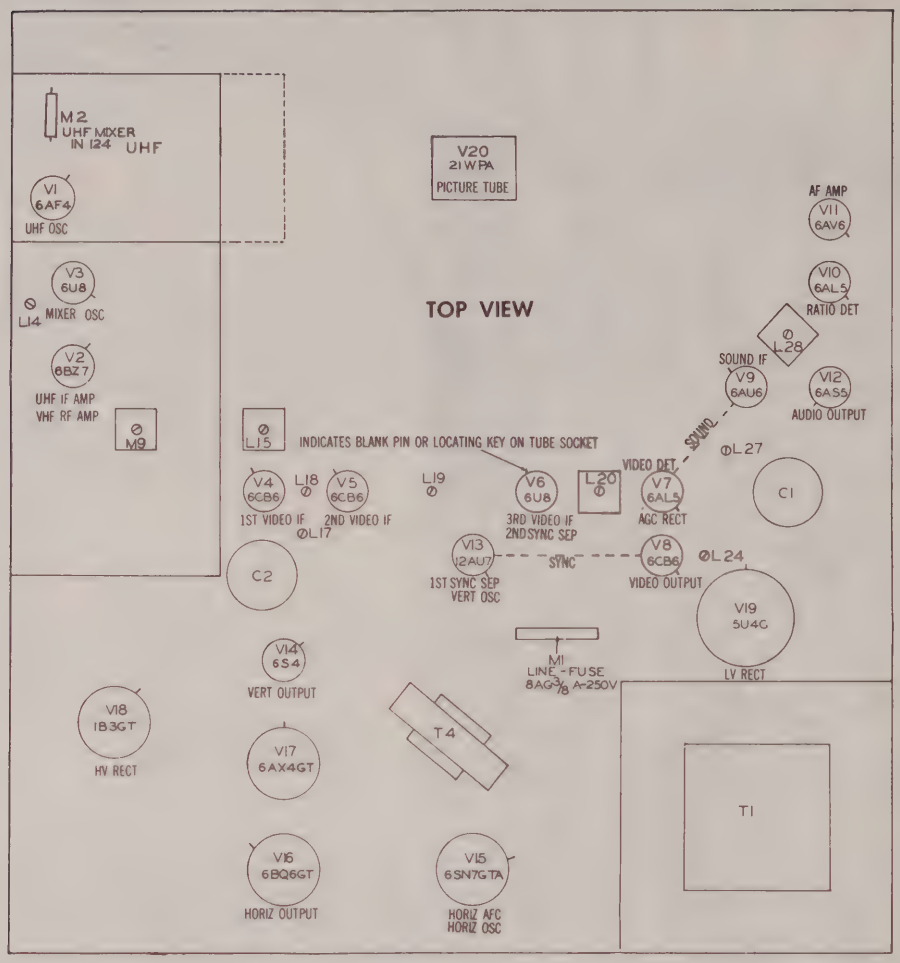
Alignment may be performed without complete removal of radio tuner from TV chassis.
The under side of the tuner becomes accessible by removing the tuning drive drum and four self tapping screws at front and rear of tuner.
Use a short jumper to connect the radio tuner chassis to the TV chassis.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
23.	.1MFD	High side to antenna stator lug on tuning gang. Low side to chassis.	455KC (400~Mod)	AM	Tuning gang fully open	Across voice coil	A33, A34, A35, A36	Adjust for maximum output.
24.	"	"	1620KC	"	"	"	A37	"
25.		Loop	1400KC	"	Tune to 1400KC signal	"	A38	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output. Repeat steps 23, 24 and 25.

RADIO ALIGNMENT (3D1 RADIO CHASSIS)

Remove the radio escutcheon so that IF adjustments (A34 and A36) are accessible. Turn bandswitch to "AM" position.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Alignment of the 3D1 radio chassis and the radio tuner is identical. Follow procedure outlined under "Radio Tuner Alignment (used on 19M2 chassis)".

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - V19,

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - V3, V4, V5, V6, V7, V12 (V1 UHF only)
No pic, no sound, has snow - V2, V3, V4
No pic, has sound, has raster - V8, V20
Has pic, no sound - V9, V10, V11, V12

SYNC FAILURE
No vert. sync - V6, V13
No horiz. sync - V6, V15
No vert. or horiz. sync - V6, V13

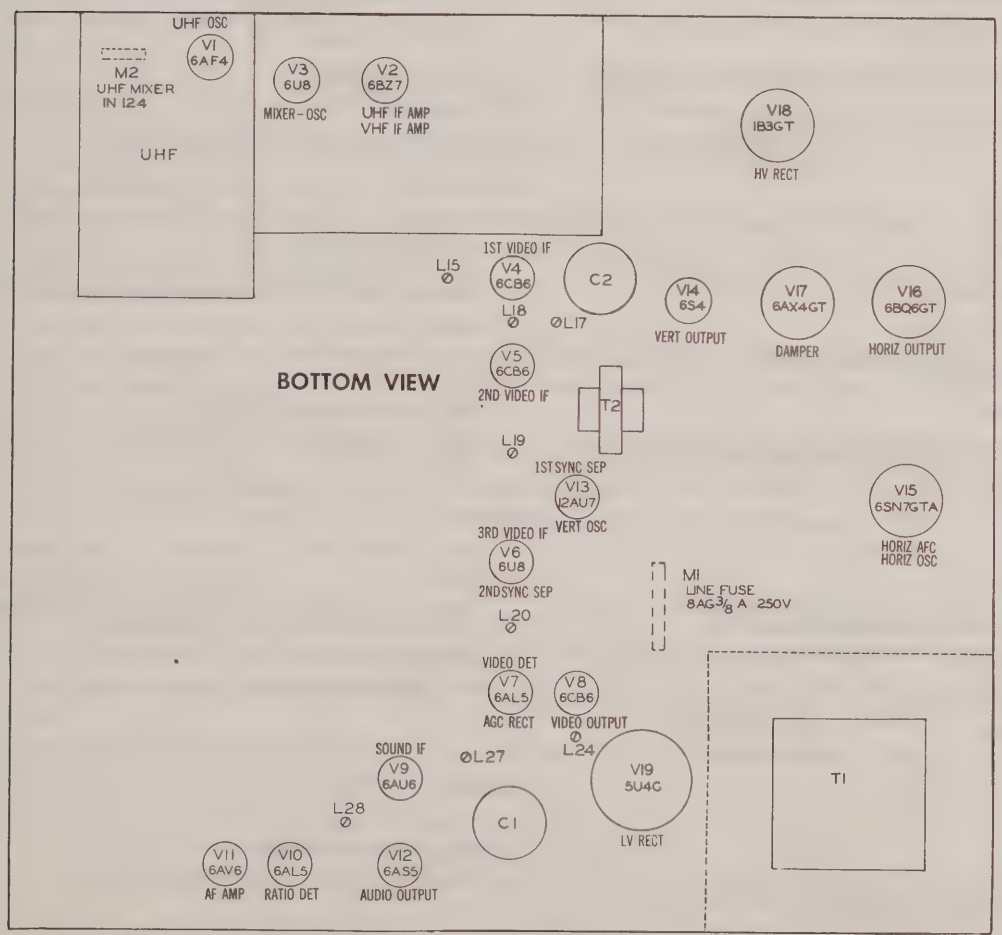
SWEEP FAILURE
No raster, has sound - V15, V16, V17, V18, V20, Fuse (M1)
No vertical deflection - V13, V14
Poor vert. linearity or foldover - V13, V14
Poor horiz. linearity or foldover - V15, V16, V17
Narrow picture - V15, V16, V17, V18, V19
Vert. off freq. - V6, V13
Horiz. off freq. - V6, V15

PROPERTY OF
L. F. B[illegible]
5934 MEADE ST.
DENVER, COLORADO

RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AF4	†▲11KΩ	6.8KΩ	0Ω	.1Ω	0Ω	6.8KΩ	†▲11KΩ		
V 2	6BZ7	†2.8KΩ	†450KΩ	INF	0Ω	.1Ω	INF	5Meg	0Ω	0Ω
V 3	6U8	■3.6KΩ	200KΩ	†100KΩ	.1Ω	0Ω	†10KΩ	0Ω	0Ω	10KΩ
V 4	6CB6	2.7Meg	47Ω	.1Ω	0Ω	†5.6KΩ	†5.6KΩ	0Ω		
V 5	6CB6	2.7Meg	68Ω	.1Ω	0Ω	†5.6KΩ	†5.6KΩ	0Ω		
V 6	6U8	■18KΩ	0Ω	■330Ω	0Ω	.1Ω	■330Ω	150Ω	0Ω	10KΩ
V 7	6AL5	0Ω	5.6KΩ	0Ω	.1Ω	0Ω	0Ω	2.2Meg		
V 8	6CB6	1Meg	100Ω	.1Ω	0Ω	†6.8KΩ	■2.3KΩ	100Ω		
V 9	6AU6	470KΩ	0Ω	.1Ω	0Ω	■330Ω	■330Ω	100Ω		
V 10	6AL5	10KΩ	10KΩ	.1Ω	0Ω	INF	0Ω	INF		
V 11	6AV6	350KΩ	680Ω	.1Ω	0Ω	0Ω	0Ω	†470KΩ		
V 12	6AS5	15KΩ	1Meg	.1Ω	0Ω	1Meg	†1.3KΩ	†300Ω		
V 13	12AU7	■1Meg	2.7Meg	0Ω	0Ω	0Ω	▲1.7Meg	2.2Meg	0Ω	.1Ω
V 14	6S4	INF	2KΩ	1Meg	.1Ω	0Ω	1Meg	INF	INF	▲2.5KΩ
V 15	6SN7GTA	1.5Meg	†22KΩ	450KΩ	480KΩ	†82KΩ	0Ω	0Ω	.1Ω	
V 16	6BQ6GT	†8.2KΩ	0Ω	†80Ω	†8.2KΩ	1Meg	†82KΩ	.1Ω	47Ω	Top Cap ▲23Ω
V 17	6AX4GT	▲1.4KΩ	INF	300KΩ	INF	†100Ω	INF	.1Ω	0Ω	
V 18	1B3GT		PINS	1-8	HAVE	INFINITE	RESISTANCE			Top Cap ▲558Ω
V 19	5U4G	INF	30KΩ	†6.8KΩ	20Ω	INF	21Ω	.1Ω	30KΩ	
V 20	21WP4	.1Ω	56KΩ	Pin 10 ▲1.2KΩ	Pin 11 ■220KΩ	Pin 12 0Ω				

▲ MEASURED IN "UHF" POSITION.
† MEASURED FROM PIN 8 OF V19.
■ MEASURED FROM 115V LINE.
▲ MEASURED FROM PIN 3 OF V17.



TUBE PLACEMENT CHART

SET 266 FOLDER 1

TROUBLE SHOOTING AIDS

SWEEP

HORIZONTAL

LOSS OF SWEEP

Follow procedure outlined under "Loss of High Voltage".

INSUFFICIENT SWEEP

Check by substitution V16, V17 and V19. Check adjustments B3, B4 and B5. Check R94, R96, C74, T3, T5A and other associated components.

DRIVE LINES

Check by substitution V16 and V17. Check adjustments B3 and B5. Check C74, C76, R96, T3, T5A and other associated components.

COMPRESSED LEFT SIDE

Check by substitution V16 and V17. Check horizontal output and damper stages for component failure or change of value.

FOLDS

Follow procedure outlined under "Drive Lines".

PIE CRUST EFFECT

Check by substitution V15, V16 and V17. Check C69 for open. Check C70, L29, R88 and R85. Check adjustments B1, B2 and other associated components.

XMAS TREE EFFECT

Check by substitution V15, V16 and V17. Check T3 and T5A for internal arcing. Check L29, C71, C72, C74, R91, R 86, R88 and other associated components.

VERTICAL

LOSS OF SWEEP

Check by substitution V13 and V14. Check waveform W7.

If Satisfactory	If Unsatisfactory
Check T4, T5B, R76, R5, C2B, C3 and other associated components.	Check C62, R97, R73, R6, T2 and other associated components.

INSUFFICIENT SWEEP

Check by substitution V13 and V14. Check height and vertical linearity controls for proper operation. Check T4, T5B and R73.

COMPRESSED AT BOTTOM

Check by substitution V13 and V14. Check R97, R73, R6, T2, C61 and other associated components.

COMPRESSED AT TOP

Check by substitution V13 and V14. Check C2B, R76, R5, T4 and other associated components.

FOLDS

Check by substitution V13 and V14. Check R74, C61, T4 and other associated components.

SYNC

LOSS OF VERTICAL AND HORIZONTAL SYNC

Check by substitution V13 and V6. Check C57B, C58, R66, R68 and other associated components.

LOSS OF VERTICAL SYNC - HORIZONTAL SYNC SATISFACTORY

Substitute V13. Check T2, R72, R2, R70 and C60. Check vertical integrator network and other associated components.

LOSS OF HORIZONTAL SYNC - VERTICAL SYNC SATISFACTORY

Substitute V15. Check C64, R86, R3, R85, L29 and R88. Check horizontal AFC network.

HORIZONTAL BENDING

Check by substitution V6, V13 and V15. Check horizontal AFC network.

VIDEO

LOSS OF VIDEO

Substitute V8. Check C42, C44, R41, L26, L25, R61, R40 and other associated components.

SOUND BARS (4.5MC BEAT)

Adjust tuner fine tuning for best sound and picture. Check adjustment A11. Check video IF alignment.

POOR CONTRAST

Substitute V8. Check contrast control, video detector network and picture tube. Check R40, L22, C42, C44 and other associated components.

NEGATIVE PICTURE

Substitute V8. Check picture tube, video detector network and fine tuning adjustment. Check C44, L23, L22 and other associated components.

SMEAR

Check by substitution V7 and V8. Check L22, L23, L25, L26, C42, C44 and other associated components.

WIDE BLACK BAR ACROSS PICTURE

Check by substitution V2, V4, V5, V6, V7 and V8 for heater to cathode leakage.

AUDIO

WEAK OR NO SOUND

Check by substitution V9, V10, V11 and V12. Check stages V11 and V12 using audio signal generator. Apply audio signal across R18.

If Satisfactory	If Unsatisfactory
Check ratio detector and audio IF stages for component failure or change of value.	Check C51, C52, C53, C55, C4, R63, T8, speaker and other associated components.

BUZZ

Adjust tuner fine tuning for best sound and picture. Check adjustment A10. If still unsatisfactory check audio IF alignment.

DISTORTED

Follow procedure outlined under "Weak or No sound".

POWER

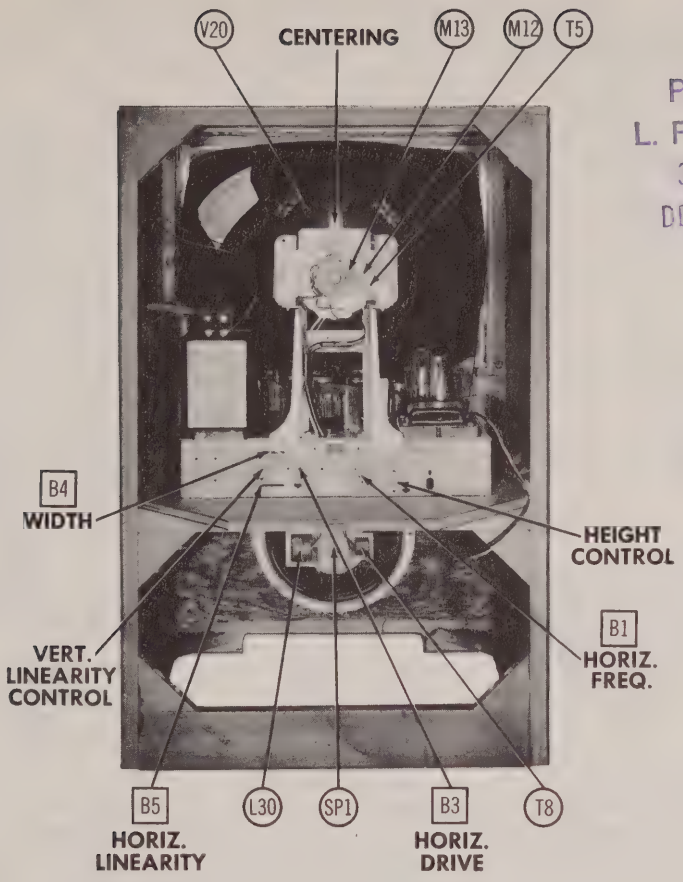
DEAD SET

If filaments fail to light, check AC interlock assembly. Check switch on volume control and T1. If filaments light, check M1 fuse. Substitute V19. Check B+ filter and decoupling network.

SMALL AND/OR DIM PICTURE

Substitute V19. Check B+ filter and decoupling network.

PROPERTY O
L. F. BLANKENSH
DENVER, COLORAD



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

1. If set employes a DX range finder control, it should be set to the "O" position. Set the contrast control for normal picture.
2. Connect the high side of vertical amplifier of oscilloscope thru a 10MMFD capacitor to terminal "C" (or "2") of L29.
3. Adjust horizontal waveform slug (B2) for pattern similar to Fig. 10 with the broad and narrow peaks of equal amplitude. Keep picture in sync while making this adjustment by adjusting the horizontal frequency slug (B1).
4. Turn horizontal hold control maximum counter clockwise. If picture does not lose sync switch off channel and back again or adjust B1 until several diagonal bars sloping downward to the left appear on the screen, then adjust B1 until the picture just falls into sync.
5. Holding action should be as follows:
   a. The picture should remain in sync throughout the entire rotation of the horizontal hold control on strong and medium signals.
   b. The picture should remain in sync over 1/2 to 3/4 rotation of the horizontal hold control on weak signals.
   c. If picture loses sync or is unstable in either (a) or (b) above, readjust B1. Repeat (a), (b) and (c) until satisfactory holding action is obtained.

HORIZONTAL DRIVE ADJUSTMENT

Switch channel selector to an unused channel.

Set brightness control for a lower than average brightness level. Turn contrast control and horizontal hold control fully counter clockwise.

Turn the horizontal drive trimmer (B3) counter clockwise as far as possible without the presence of vertical white lines near the center of the picture.

Adjust the width coil slug (B4) for a picture that is slightly wider than necessary to fill the picture mask horizontally.

Adjust the horizontal linearity coil slug (B5) for a picture that is symmetrical from left to right.

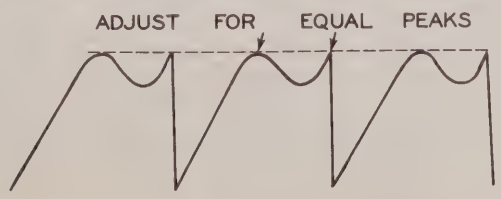
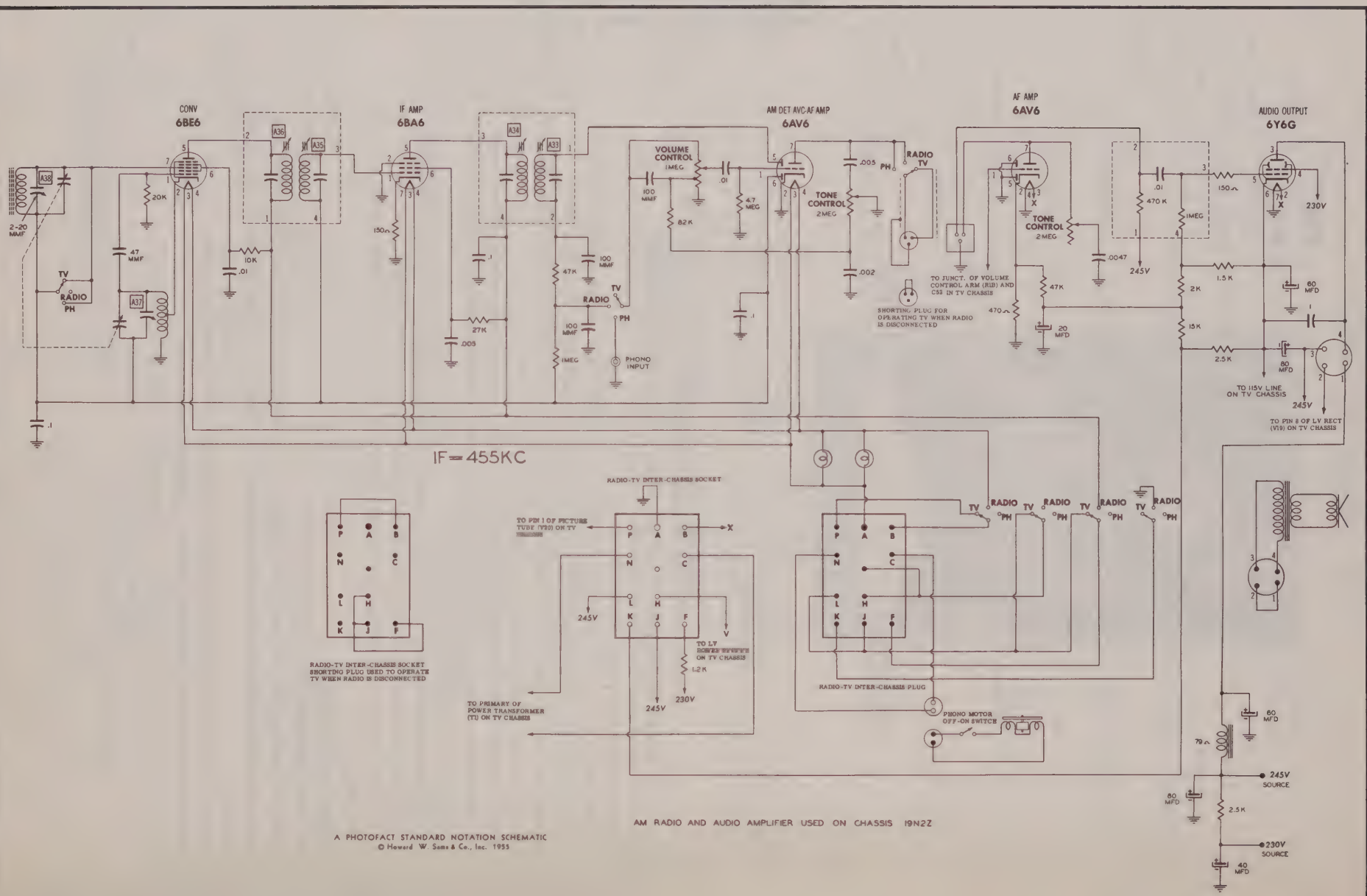


FIG. 10



AM RADIO AND AUDIO AMPLIFIER USED ON CHASSIS 19N2Z

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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RADIO SCHEMATIC

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		ADMIRAL PART No.	STANDARD REPLACEMENT		
V1	UHF Oscillator	6AF4	6AF4	7DK	
V2	UHF IF Amplifier-VHF RF Amplifier	6BZ7	6BZ7	9AJ	
V3	Mixer - Osc.	6U8	6U8	9AE	
V4	1st. Video IF Amp.	6CB6	6CB6	7CM	
V5	2nd. Video IF Amp.	6CB6	6CB6	7CM	
V6	3rd. Video IF Amp.-2nd. Sync Separator	6U8	6U8	9AE	
V7	Video Detector-AGC Rectifier	6AL5	6AL5	6BT	
V8	Video Output	6CB6	6CB6	7CM	
V9	Sound IF Amp.	6AU6	6AU6	7BK	
V10	Ratio Detector	6AL5	6AL5	6BT	
V11	AF Amplifier	6AV6	6AV6	7BT	
V12	Audio Output	6AS5	6AS5	7CV	6Y6G audio output used in chassis 19N2Z, 19M2 & 19Y1A
V13	1st. Sync Separator-Vert. Osc.	12AU7	12AU7	9A	
V14	Vert. Output	6S4	6S4	9AC	
V15	Horiz. AFC-Horiz. Osc.	6SN7GTA	6SN7GTA	8BD	
V16	Horiz. Output	6BQ6GT	6BQ6GT	6AM	
V17	Damper	6AX4GT	6AX4GT	4CG	
V18	HV Rectifier	1B3GT	1B3GT	3C	
V19	LV Rectifier	5U4G	5U4G	5T	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA					RETMA BASE TYPE	NOTES
	ADMIRAL PART No.	CBS-HYTRON PART No.	GENERAL ELECTRIC PART No.	SYLVANIA PART No.	WESTINGHOUSE PART No.		
V20	21WP4	21WP4		21WP4		12N	① Circuit changes
	21ZP4A	21ZP4A	21ZP4A	21ZP4A	21ZP4A	12N	necessary
	21ZP4B ②	21ZP4B ②	21ZP4B ②	21ZP4B ②	21ZP4B ②	12N	② Aluminized
		21WP4A ②		21WP4A ②		12N	
	17BP4	17BP4		17BP4	17BP4	12D	
		17BP4A ①		17BP4A ①		12N	
			17BP4B			12D	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	ADMIRAL PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	▲60	350	67D15-23	E4D581		DI45		FP419.66	TVL-4609	
B	■40	350								
C	▲60	200								
D	20	150								
C2A	▲80	350	67D15-22	AFH3-142		C109		FP229.8	TVL-3722	
B	▲100	50								
C3	20	450	67A21-1	PRS450/20		BR2045		TC75	TVA-1709	
C4	80	350	67D15-64	PRS450/80		BBRD4445		FP149	TVA-1716	
C5	4	50	67A4-9	PRS150/4		BR550		TC30	TVA-1303	
C6	.68		94D66-51		TCZ-.68	TZ02	NP0A-0R68			
C7	.68		94D66-51		TCZ-.68	TZ02	NP0A-0R68			
C8	390		94D66-56							
C9	390		94D66-56							
C10	800		94D66-54	EF-001	MFT-1000				503C-D1	
C11	25		94D66-52	SI25NP0	TCZ-25	Z026	NP0K-250			
C12	800		94D66-55	BPD-0008	DD-801	K067	801-0008	DC-538	5GA-T8	Note 5
C13	1000		94D64-101	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C14	.5-3		98A45-23		829-3		3115-01-0R5	CT565A		
C15	6.8		94D64-85	SI6.8NP0	TCZ-6.8	TZ08	NP0A-6R8	ZT-5568	5TCCB-V68	
C16	3		94D64-86	SI3NP0			NP0A-030	ZT-553		
C17	.5-3		98A45-23		829-3		3115-01-0R5	CT565A		
C18	1.5		94D64-87	SI1.5NP0	TCZ-1.5	TZ04	NP0A-1R5	ZT-5515	5TCCB-V15	
C19	800		94C37-90	EF-001	MFT-1000				503C-D1	
C20	800		94C37-90	EF-001	MFT-1000				503C-D1	
C21	800		94C37-90	EF-001	MFT-1000				503C-D1	
C22	47		94D64-88	BPD-000047	DD-470	G033	801-000047	UC-5447	5GA-Q47	
C23	800		94C37-90	EF-001	MFT-1000				503C-D1	
C24	47									
C25	.5-3		98A45-23		829-3		3115-01-0R5	CT565A		
C26	220		94D64-89	BPD-00022	DD-221	G051	801-00022	DC-5322	5GA-T22	
C27	.5-3		98A45-23		829-3		3115-01-0R5	CT565A		
C28	10		94D64-91	SI10N750	TCZ-10	TN01	N750A-100	NT-541	5TCU-Q1	
C29	5		94D64-100							
C30	1000		94D64-101	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C31	.1	400	64B9-7	P488-1	DF-104	CUB4P1		PT401	4TM-P1	
C32	2.2		65C6-86	SI2.2NP0	TCZ-2.2	TZ05	NP0K-2R2		5TCCB-V22	
C33	15		65C6-50	SI15NP0	TCZ-15	TZ11	NP0K-150		5TCC-Q15	
C34	1000		65C6-41	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C35	1000		65C6-41	SI1000	D6-102	TP52	GP2K-102	UC-521	5HK-D1	
C36	5000		65C10-1	BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C37	5000		65C10-1	BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C38	1000		65C6-41	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C39	5000		65C10-1	BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C40	.47	100	64A10-1	P288-5		PJ2P5		PT405	2TM-P5	
C41	2.2		65C6-86	SI2.2NP0	TCZ-2.2	TZ05	NP0K-2R2		5TCCB-V22	
C42	.1	200	64B9-7	P288-1	DF-104	PJ2P1		PT401	2TM-P1	
C43	6.8		65C6-71							
C44	.22	400	64B8-24	P488-2		CUB4P2		PT402	4TM-P2	
C45	6.8		65C6-71							
C46	20		65C6-51	SI20	D6-220	TZ13	GP1K-200	ZT-542	5GA-Q2	
C47	5000		65C10-1	BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C48	180		65C6-59							
C49	500		65C6-6	SI500	D6-501	TP47	GP2L-501	UC-535	5GA-T5	
C50	.0022	600	64B9-17	P688-0022	D6-222	CUB6D22	GP2L-222	PT6222	6TM-D22	
C51	10000		64B8-13	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C52	50		65C6-4	SI50	D6-500	TP30	GP1K-500	UC-545	5GA-Q5	

PROPERTY
L. F. BLANKEN

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA ADMIRAL PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C53	10000		●53B6-3	BPD-01	DD-103	K063	811-D1	DC-811	5HK-81	Note 1
C54	.0047	400		P488-003	DS-502	CUB6E3	GPS-333-503	PT631	67M-D5	Note 3
C55	.02	400	64B9-15	P688-03	DF-303	CUB6E3		PT612	67M-S3	Note 3
C56	18	300	55B5-4			22F5Q18				
C57A	150		●53C6-8	SU150	D6-151	TP38	GPIK-151	UC-5315	5GA-T15	
B	10000			BPD-01	DD-103	K063	811-D1	DC-811	5HK-81	
C58	.1	300	64B9-39	P388-1	DF-104	P12F1		PT401	37M-P1	
C58A	2000									
B	5000		●63C6-11	●PA-129	●PC-100	●1157M1	●1403-01		●V-1	
C	5000									
C60	4700	500	55B21-472			22R5Q472				
C61	.047	600	64A3-16	P668-047	DF-503	CUB6S5		PT615	67M-S5	
C63	.1	800	64B9-7	P668-1	DF-104	CUB6P1		PT601	67M-P1	
C63A	10000		●63C6-5	BPD-01	DD-103	K063	811-D1	DC-811	5HK-81	
B	10000			BPD-01	DD-103	K063	811-D1	DC-811	5HK-81	
C64	82	500	55B21-820			22R5Q82				
C65	68	500	55B21-680			22R5Q68				
C66	82	500	55B21-820			22R5Q82				
C67	.1	200	64B9-7	P388-1	DF-104	P12F1		PT401	37M-P1	
C68	.47	100	64B9-75	P388-5		P12F5		PT405	37M-P5	
C69	.022	400	64B9-11	P488-022		CUB4E2		PT4123	47M-S3	
C70	.047	600	64B9-9	P668-05	DF-503	CUB6S5		PT615	67M-S5	
C71	270	500	55B21-271			22R5Y27				
C72	.01	400	64A2-16							
C73	820	500	55B21-821			22R5Q82				
C74	680	500	55B21-681			22R5Q68				
C75	.047	600	64A3-16	P668-05	DF-503	CUB6S5		PT615	67M-S5	
C76	.1	200	64B9-7	P388-1	DF-104	P12F1		PT401	37M-P1	
C77	.047	800	64A2-14	P668-05	DF-503	CUB6S5		PT615	67M-S5	
C78	.047	600	64A2-14	P668-05	DF-503	CUB6S5		PT615	67M-S5	
C79	.1	400	64B9-7	P488-1	DF-104	CUB4P1		PT403	47M-P1	
C80	47	1500	55B1-54	HVD15-47	D3E-470	MC047	IR5KV-470		20GA-Q47	
C81	.1	400		P488-1	DF-104	CUB4P1		PT401	47M-P1	Note 4

Note 1. Some versions may use original part no. 83C6-5.
Note 2. Not used in 19T1C and 19W1B chassis.
Note 3. Some versions use an .01MFD capacitor in 600V in this application.
Note 4. Used in 19M2 chassis only.
Note 5. Not used in all versions.
● Items C53 and R60A, R60B, R60C are combined in one unit.
● Items C57A, C57B and R101 are combined in one unit.
● Items C58A, C59B, C59C, R71A and R71B are combined in one unit.
▲ Items C63A, C63B, R78A and R79B are combined in one unit.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA ADMIRAL PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1000Ω	½	75B11-31	●QJ-397	RTV-396	SBB-733-8	UF13L UR16A	Contrast Panel - Note 1 Volume-Rear - Note 2
B	1Meg	½					UB-28	Attach to R1B
C	Switch							
R2A	1Meg	½	75C13-23	Q11-139	A47-1Meg-8	B-75	U-56	Vertical Hold - Note 3
B	Shaft		Not Req.	Not Req.	KS6-3	Not Req.	Not Req.	Attach to R2A
R3A	50KΩ	½	75C13-23	Q11-133	A47-50K-8	AB-53	U-35	Horiz. Hold - Note 3
B	Shaft		Not Req.	Not Req.	KS-2	AK-4	Not Req.	Attach to R3A
R4A	100KΩ	½	75C13-35	Q11-138	A47-100K-8	B-40	U-41	Brightness
B	Shaft		Not Req.	Not Req.	KS6-3	Not Req.	Not Req.	Attach to R4A
R5A	3000Ω	½	75B13-7	Q11-123	A47-3000-8	AB-8	U-8	Vert. Linearity - Note 4
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R5A
R6A	2.5Meg	½	75C13-3	Q11-230	A47-2.5Meg-8	AB-83	U-355	Height
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R6A
R7A	3Meg	½	75B13-32	Q11-139	A47-3Meg-8	AB-75	U-56	Tone - Note 5
B	Shaft		Not Req.	Not Req.	KS6-3	AK-4	Not Req.	Attach to R7A
R8A	3Meg	½	75C1-53	Q11-139	A47-3Meg-8	B-75	U-56	Range Finder - Note 6
B	Shaft		Not Req.	Not Req.	FU-3	Not Req.	Not Req.	Attach to R8A

* CONCENTRIKIT EQUIVALENT: KIT K-2, BASE ELEMENTS & SHAFTS: R17-108 & P1-126 (PANEL)
R13-137 & R2-215 (REAR)
76-1 SWITCH

† Universal Replacement (Mallory exact duplicate part no. UE57L)
Note 1: In chassis 19M2 & 19T1A this is a single control part no. 75C13-21.
Note 2: In chassis 19M2 & 19T1A this is a single control part no. 75C3-16.
Note 3: In chassis 19M2 & 19T1A this is a dual concentric control part no. 75B17-3.
Note 4: Some versions may use an alternate control part no. 75C13-7.
Note 5: Used in chassis 19N2Z, 19L2Z, 19L3, 19T1A, 19W1, 19M2, 19W1C & 19M2 only.
Note 6: Used in chassis 19M2, 19L2, 19L3Z, 19W1A, 19W1, 19T1, 19M2, 19M2Z & 19W1C only.

RESISTORS

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA ADMIRAL PART No.	IRC PART No.	NOTES
R9	100KΩ	½	60B8-471	BTS-100K	Note 13
R10	130KΩ	1	60B8-124	BTA-120K	
R11	10Ω	½	60B8-100	BTS-10	
R12	47KΩ	½	60B8-473	BTS-47K	
R13	22KΩ	½	60B8-223	BTS-22K	
R14	820KΩ	½	60B8-824	BTS-820K	
R15	1500Ω	½	60B8-152	BTA-1500	
R16	470KΩ	½	60B8-474	BTS-470K	
R17	100KΩ	½	60B8-104	BTS-100K	
R18	100KΩ	½	60B8-104	BTS-100K	
R19	100KΩ	½	60B8-104	BTS-100K	
R20	8200Ω	½	60B8-822	BTS-8200	
R21	10KΩ	½	60B8-103	BTS-10K	
R22	3300Ω	1	60B14-332	BTA-3300	
R23	15KΩ	½	60B8-153	BTS-15K	
R24	4700Ω	½	60B8-472	BTS-4700	
R25	10KΩ 5%	5	61A17-2	1 3/4A-10K5%	
R26	1200Ω	½	60B20-122	BTS-1200	
R27	330Ω	½	60B8-331	BTS-330	
R28	100KΩ	½	60B8-104	BTS-100K	
R29	470Ω	½	60B28-45	BTS-47	
R30	1000Ω	½	60B8-102	BTS-1000	

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA ADMIRAL PART No.	IRC PART No.	NOTES
R31	24KΩ 5%	½	60B7-243	BTS-24K 5%	
R32	1000Ω	½	60B8-102	BTS-1000	
R33	68Ω	½	60B28-44	BTS-68	
R34	1000Ω	½	60B8-102	BTS-1000	
R35	24KΩ 5%	½	60B7-243	BTS-24K 5%	
R36	150Ω	½	60B8-151	BTS-150	
R37	330Ω	½	60B8-331	BTS-330	
R38	5600Ω	½	60B8-562	BTS-5600	
R39	1Meg	½	60B8-105	BTS-1Meg	
R40	47KΩ	½	60B8-473	BTS-47K	Note 1 & Note 13
R41	5600Ω	1	60B14-562	BTA-5600	
R43	27KΩ	½	60B8-273	BTS-27K	
R43	180KΩ	½	60B8-184	BTS-180K	
R44	2.2Meg	½		BTS-2.2Meg	
R45	470KΩ	½	60B8-474	BTS-470K	
R46	3.3Meg	½	60B8-335	BTS-3.3Meg	
R47	15Meg	½	60B8-156	BTS-15Meg	
R48	1.5Meg	½	60B8-155	BTS-1.5Meg	Note 12
R49	680KΩ	½	60B8-684	BTS-680K	Note 14
R50	56KΩ	½	60B8-563	BTS-56K	
R51	470KΩ	½	60B8-474	BTS-470K	

RESISTORS (cont)

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA ADMIRAL PART No.	IRC PART No.	NOTES
R52	100Ω	½	60B28-19	BTS-100	Note 2
R53	330Ω	½	60B8-331	BTS-330	
R54	10KΩ	½	60B8-103	BTS 10K	
R55	10KΩ	½	60B8-103	BTS-10K	
R56	390Ω	½	60B8-391	BTS-390	
R57	47KΩ	½	60B8-473	BTS-47K	
R58	68Ω	½	60B8-681	BTS-680	Note 3
R59	68KΩ	½	60B8-683	BTS-68K	Note 4
R60A	150KΩ		●63B6-3	BTS-470K	
B	47KΩ			BTS-47K	
C	1Meg			BTS-1Meg	
R61	15000Ω 5%	½	60B7-152	BTS-1500 5%	Note 5
R62	8200 5%	½	60B7-822	BTS-820 5%	
R63	1300Ω	1	60B14-132	BTA-1300	Note 6
R64	4500Ω	8	61B17-1		
R65	2.7Meg	½	60B8-275	BTS-2.7Meg	
R66	1Meg	½	60B8-105	BTS-1Meg	Note 7
R67	100KΩ	½	60B8-103	BTS-10K	
R68	18KΩ	½	60B14-183	BTA-18K	Note 8
R69	10KΩ	½	60B8-103	BTS-10K	Note 9
R70	22KΩ	½	60B8-223	BTS-22K	
R71A	8200Ω		●63C6-11	BTS-8200	
B	8200Ω			BTS-8200	
R72	1.2Meg	½	60B8-125	BTS-1.2Meg	Note 10
R73	1Meg	½	60B8-105	BTS-1Meg	
R74	10KΩ 5%	½	60B7-103	BTS-10K 5%	
R75	1Meg	½	60B8-105	BTS-1Meg	
R76	820Ω	½	60B8-821	BTS-820	
R77	560Ω	½	60B8-561	BTS-560	

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA ADMIRAL PART No.	IRC PART No.	NOTES
R78	560Ω	½	60B8-561	BTS-560	
R78A	27000		●53C6-5	BTS-27K	
B	56KΩ			BTS-56K	
R80	330KΩ	½	60B8-334	BTS-330K	
R81	82KΩ 5%	½	60B7-823	BTS-82K 5%	
R82	820KΩ	½	60B8-824	BTS-820K	
R83	330KΩ	½	60B7-334	BTS-330K 5%	
		5%			
R84	3900Ω	½	60B8-392	BTS-3900	
R85	68KΩ	½	60B8-683	BTS-68K	
R86	22KΩ	½	60B8-223	BTS-22K	
R87	150KΩ 5%	½	60B7-154	BTS-150K 5%	
R88	8200Ω	½	60B8-822	BTS-8200	
R89	150KΩ	½	60B8-154	BTS-150K	
R90	820KΩ	½	60B8-824	BTS-820K	
R91	82KΩ	½	60B8-823	BTS-82K	
R92	82Ω	½	60B28-21	BTS-82	
R93	1Meg	½	60B8-105	BTS-1Meg	
R94	47Ω	1	60B14-470	BTA-47	
R95	82Ω	½	60B28-21	BTS-82	
R96	8200Ω	2	60B20-822	BTS-8200	
R97	1200Ω	2	60B20-122	BTS-1200	
R98	10000Ω	2	60B20-102	BTS-10000	
R99	1000Ω	½	60B8-102	BTS-1000	
R100	270KΩ	1		BTA-270K	
R101	270KΩ	½	●53C6-8	BTS-270K	
R103	12KΩ	½	60B8-123	BTS-12K	Note 11
R104	270KΩ	½		BTS-270K	Note 13
R104	4.7Ω		60B28-11		

● Items R60A, R60B, R60C and C53 are combined in one unit.
● Items R71A, R71B, C59A, C59B and C59C are combined in one unit.
▲ Items R78A, R79B, C63A and C63B are combined in one unit.
● Items R101, C57A and C57B are combined in one unit.
Note 1: Some versions use a 33KΩ resistor in this application.
Note 2: Early versions use 68Ω 1 watt in this application.
Note 3: Chassis 19M2 uses 470Ω 1 watt in this application.
Note 4: Chassis 19M2 & 19N2Z use 47KΩ ½ watt in this application.
Note 5: Chassis 19M2 & 19N2Z use 2000Ω 1 watt in this application.
Note 6: Chassis 19M2 uses 1200Ω 5 watt and chassis 19M2Z uses 2500Ω 10 watts in this application.
Note 7: Chassis 19M2 uses 47KΩ ½ watt in this application.
Note 8: Chassis 19M2 & 19N2Z use 47KΩ 2 watt in this application.
Note 9: Chassis 19M2 & 19N2Z use 15KΩ 1 watt in this application.
Note 10: Early productions use a 1.5Meg ½ watt in this application.
Note 11: Used only in chassis 19M2 & 19T1A.
Note 12: Not used in chassis 19S2.
Note 13: Not used in some versions.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA ADMIRAL PART No.	Stancor PART No.	Triad PART No.	RCA TYPE No.	Halldorson PART No.	Thordorson PART No.
T1	117VAC	568VCT	5VAC	80C35-3	P-8154		R-61BC①	P8733	
	⑥1.64A	.246ADC	⑥ 3A						
		SEC. 3	SEC. 4	SEC. 5					
		6.3VAC							
		⑥8.3A							

① Parallel and phase 6.3V ⑥ 8A for Sec. #3. Tape 6.3V ⑥ 1.2A winding.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No	USE	Admiral PART No.	Halldorson PART No.	Merit PART No.	RCA PART No.	Rem PART No	Stancor PART No	Thordorson PART No	Triad PART No
T2	Vert. Osc. Trans.	78A18-4	B6702	A-3003	209T1 ①	V405	A-8125	24A87 ①	A-97X
T3	Horiz. Output Trans.	78D41-1	FB41*②	HV0-32*	230T1*②	X005*	A-8135*	FLY-21*	D-19* ②
T4	Vert. Output Trans.	78B40-2	Z1804 ①	A-3037①	222T1 ①	V315①	A-8123 ①	24B52 ①	A-102X①
T5A	Yoke-Horiz. (20MH)	94C58-1	DF605	MDF-73	252DA	T70F20/43	DY-DA	Y-8	Y-32-1
B	Yoke (40MH)								
T6	Horiz. Linearity-(1.5-10MH)	94A50-1	RF800③ ⑤	MWC-6 ③	212R1 ③	20IR15 ③	WC-8 ③	WC-18 ③	WC-12③④
T7A	Width-(4-28MH)	94A49-2							
B	(2-2.1MH)								

① Drill one new mounting hole.
② Drill two mounting holes.
③ Drill new mounting hole or use original slider and core.
④ Connect to coded blue and red terminals.
⑤ Connect to coded #3 and #4 terminals.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

	ORIGINAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	RCA Replacement Connections	Rem Replacement Connections	Stancor Replacement Connections	Thordorson Replacement Connections	Triad Replacement Connections
	4	9	4	9	4	4	4	9
	3	5	3	5	3	3	3	5
	2	3	2	3	2	2	2	3
	1	1	1	1	1	1	1	1
Connect Width Coil Across	2 & 1	3 & 1	2 & 1	3 & 1	2 & 1	2 & 1	2 & 1	3 & 1
Special Notes								④

⑤ Connect terminal #8 to terminal #7.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA ADMIRAL PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordorson PART No.	NOTES
T8	3.5KΩ	3.3Ω	Part of speaker	A-3856	A-3018 ①	S-1X	Z1001	22545	① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS SIZE	RATINGS FIELD	RATINGS V. C. IMP.	REPLACEMENT DATA ADMIRAL PART No.	VIKING PART No.	QUAM PART No.	NOTES
SP1	10"	PM	3.3Ω	78B80-3 ①	10J11	10A31	① Includes output trans. and choke used on models CA2346, RA2182, RA2217, CA2218Z, CA2217Z, CA2336 and CA2237.
	12"	PM	3.3Ω	78B77-1 ②	13J11	13A31	② Used in models LA2215Z, LA2162Z, and LA2172.
	6"	PM	3.3Ω	78B76-2 ③	6J6	6A1	③ Includes output trans., used in models KA2326, KA2217, KA2216 and KA2317.
	5"	PM	3.3Ω	78B79-2 ④	5J6	5A1	④ Includes choke and output trans., models TA2211, TA2212, TA2222, TA1811, TA1812, TA1822, TA2243, TA2324, TA2315, TA2316, TA2217 and TA2218.

COILS (RF-IF)

ITEM No.	USE	DC RES PRI.	DC RES SEC.	REPLACEMENT DATA ADMIRAL PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	UHF Ant. Coil	0Ω		94D66-57				
L2	UHF Ant. Coil	0Ω		94D66-57				
L3	UHF Ant. Coupling loop-coil	0Ω						
L4	UHF Ant. Coupling loop-coil	0Ω						
L5	UHF RF Coupling coil	0Ω		94D66-58				
L6	UHF IF Output Coil	0Ω		94D66-53				Wound on 270Ω resistor.
L7	UHF IF Input Coil	0Ω	.2Ω	94D64-103				Part of complete set; Contains L7, L8, L9, R22
L8	UHF Interstage Coil	0Ω	.2Ω	94D64-102				Part of complete set; Contains L7, L8, L9, R22
L9	UHF IF Output Coil	.1Ω	.3Ω	94D64-103				Part of complete set; Contains L7, L8, L9, R22
L10A	VHF Ant. Coil	00CT	0Ω	94D64-53				Channel 3
B	VHF Ant. Coil	00CT	0Ω	94D64-53				Channel 3
C	VHF Ant. Coil	00CT	0Ω	94D64-54				Channel 4
D	VHF Ant. Coil	00CT	0Ω	94D64-55				Channel 5
E	VHF Ant. Coil	00CT	0Ω	94D64-56				Channel 6
F	VHF Ant. Coil	00CT	0Ω	94D64-57				Channel 7
G	VHF Ant. Coil	00CT	0Ω	94D64-58				Channel 8
H	VHF Ant. Coil	00CT	0Ω	94D64-59				Channel 9
I	VHF Ant. Coil	00CT	0Ω	94D64-60				Channel 10
J	VHF Ant. Coil	00CT	0Ω	94D64-61				Channel 11
K	VHF Ant. Coil	00CT	0Ω	94D64-62				Channel 12
L	VHF Ant. Coil	00CT	0Ω	94D64-63				Channel 13
L11	VHF Neut. Coil	0Ω		94D64-104				
L12A	VHF RF, Mixer Grid & Osc. Coil	0Ω		94D64-72				Channel 2
B	VHF RF, Mixer Grid & Osc. Coil	0Ω		94D64-73				Channel 3
C	VHF RF, Mixer Grid & Osc. Coil	0Ω		94D64-74				Channel 4
D	VHF RF, Mixer Grid & Osc. Coil	0Ω		94D64-75				Channel 5
E	VHF RF, Mixer Grid & Osc. Coil	0Ω		94D64-76				Channel 6
F	VHF RF, Mixer Grid & Osc. Coil	0Ω		94D64-77				Channel 7
G	VHF RF, Mixer Grid & Osc. Coil	0Ω		94D64-78				Channel 8
H	VHF RF, Mixer Grid & Osc. Coil	0Ω		94D64-79				Channel 9
I	VHF RF, Mixer Grid & Osc. Coil	0Ω		94D64-80				Channel 10
J	VHF RF, Mixer Grid & Osc. Coil	0Ω		94D64-81				Channel 11
K	VHF RF, Mixer Grid & Osc. Coil	0Ω		94D64-82				Channel 12
L	VHF RF, Mixer Grid & Osc. Coil	0Ω		94D64-83				Channel 13
L13	VHF Fil. Choke	0Ω		94D64-103				
L14	VHF Conv. Plate	.1Ω		94D64-103				
L15	1st Video IF	0Ω		72D18-1				
L16	Fil. Choke	0Ω		73A3-5	19-3001	TV-189	4004	.6 Microhenries
L17	47.25MC trap	.5Ω		72D11-5			6255	
L18	2nd Video IF	0Ω	0Ω	72D11-6	17-4023		5219	

ADMIRAL CHASSIS 19L2, 19L2Z, 19M2, 19N2Z, 19S2, 19T1C, 19W1, 19W1A, 19W1B, 19W1C, 19Y1A

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (cont)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA ADMIRAL PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L19	3rd Video IF	0Ω	0Ω	72D111-7	17-4522		5219	
L20	4th Video IF	0Ω	0Ω	72B118-1				
L21	Series Peaking Coil	.5Ω		73A6-9	19-1002		4606	2 Microhenries
L22	Series Peaking Coil	5Ω		73A5-15	19-3180*	TV-184*	6180*	190 Microhenries; Wound on 4.7KΩ resistor
L23	Shunt Peaking Coil	15Ω		73A5-7	19-3500	TV-188	6174	500 Microhenries
L24	4.5MC trap	4.4Ω		72B99-4	17-3400	TV-151	1470	
L25	Series Peaking Coil	6.5Ω		73A5-13	19-3300■		4565■	284 Microhenries; Wound on 33KΩ resistor
L26	Shunt Peaking Coil	7.5Ω		73A5-9	19-1923▲		4648▲	370 Microhenries; Wound on 10KΩ resistor
L27	Sound IF	4.4Ω		72B99-4	17-3400	TV-151	1470	
L28	Ratio Det.	3.4Ω	.2ΩCT	72B68-2	17-1033▬	TV-110†	1468♦	Tertiary winding = .7Ω
L29	Horiz. Osc.	77Ω		69B110	20-1402	TV-162	6183	Waveform winding = 44Ω

* Parallel with 4.7KΩ resistor.
■ Parallel with 33KΩ resistor.
▲ Parallel with 10KΩ resistor
▬ Disconnect 180MMF cap across secondary.
† Disconnect cap.
♦ Alternate no. 6205--use adaptor plate & disconnect cap. with either.

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	RATINGS D. C. RESISTANCE	RATINGS INDUCTANCE (0 CURRENT 1000 ∿)	REPLACEMENT DATA ADMIRAL PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.
L30	.240ADC	79Ω	1.2 Hy.	74B18-2	C-2327	C-2994	C-21X ①	C5040	26C41

① Drill one new mounting hole.

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA ADMIRAL PART No. FUSE	ADMIRAL PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M1	8AG	3/8A 250V	84A4-3	84A5-1	362.375 (3/8A-8AG)	387001	AGX-3/8	4520

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA ADMIRAL PART No.	FEDERAL PART No.	SYLVANIA PART No.	NOTES
M2	1N124	94D66-50	1N82	1N82 or 1N82A	UHF Mixer

MISCELLANEOUS

ITEM No.	PART NAME	ADMIRAL PART No.	NOTES
M3	Dial Light	81A-1-8	#47 - Bayonet - All UHF-VHF models without radio
M4	Dial Light	81A-1-8	#47 - Bayonet - UHF-VHF models with 2 tube radio (Ch.19M2 & 19Y1A) & 3 tube radio (Ch.19N2Z)
M5	Tuner	94D64-2	VHF (All UHF-VHF models)
M6	Tuner	94D66-1	UHF (All UHF-VHF models)
M7	Tuning Cap.	68B53-1	2 tube radio (Ch.19M2 & 19Y1A)
M8	Tuning Cap.	68B32	3 tube radio (Ch. 19N2Z)
M9	Ant. Input Trap Assy.	94D64-84	VHF Tuner
M10A	Switch	77A50	UHF-VHF - wafer - front section
B	Switch	77A52	UHF-VHF - wafer - rear section
M11A	Switch	77C43	Function - 2 tube radio (Ch. 19M2 & 19Y1A)
B	Switch	77B49	Function - 3 tube radio (Ch. 19N2Z)
M12	Focus Magnet	94C53-1	Includes centering device
M13	Ion Trap	94A15-3	
B3	Trimmer Cap.	66A30-2	Horiz. Drive (10-160MMF)
	Cabinet	35E247-1	Walnut - Model TA2215
	Cabinet	35E247-2	Mahogany - Model TA2216
	Cabinet	35E247-3	Blonde - Model TA2217
	Cabinet	35E247-4	Maple - Model TA2218
	Cabinet	35E248-1	Walnut - Model CA2215Z
	Cabinet	35E248-2	Mahogany - Model CA2216Z
	Cabinet	35E248-3	Blonde - Model CA2217Z
	Cabinet	35E261-2	Mahogany - Model CA2236
	Cabinet	35E261-3	Blonde - Model CA2237
	Cabinet	35E250-2	Mahogany - Model HA2216Z
	Cabinet	35E250-3	Blonde - Model HA2217Z
	Cabinet	35E253-2	Mahogany - Model KA2216
	Cabinet	35E253-3	Blonde - Model KA2217
	Cabinet	35E254-1	Walnut - Model LA2215Z
	Cabinet	35E254-2	Mahogany - Model LA2216Z
	Cabinet	35E254-3	Blonde - Model LA2217Z
	Cabinet	34E61-9	Ebony - Model TA1811
	Cabinet	34E61-10	Mahogany - Model TA1812
	Cabinet	34E61-12	Mahogany - Model TA1822
	Cabinet	34E57-4	Ebony - Model TA2211
	Cabinet	34E57-5	Mahogany - Model TA2212
	Cabinet	34E57-9	Mahogany - Model TA2222
	Cabinet	35E276-2	Mahogany - Model CA2246
	Cabinet	35E275-2	Mahogany - Model KA2226
	Cabinet	35E275-3	Blonde - Model KA2227
	Cabinet	34E71-10	Mahogany - Model TA2242

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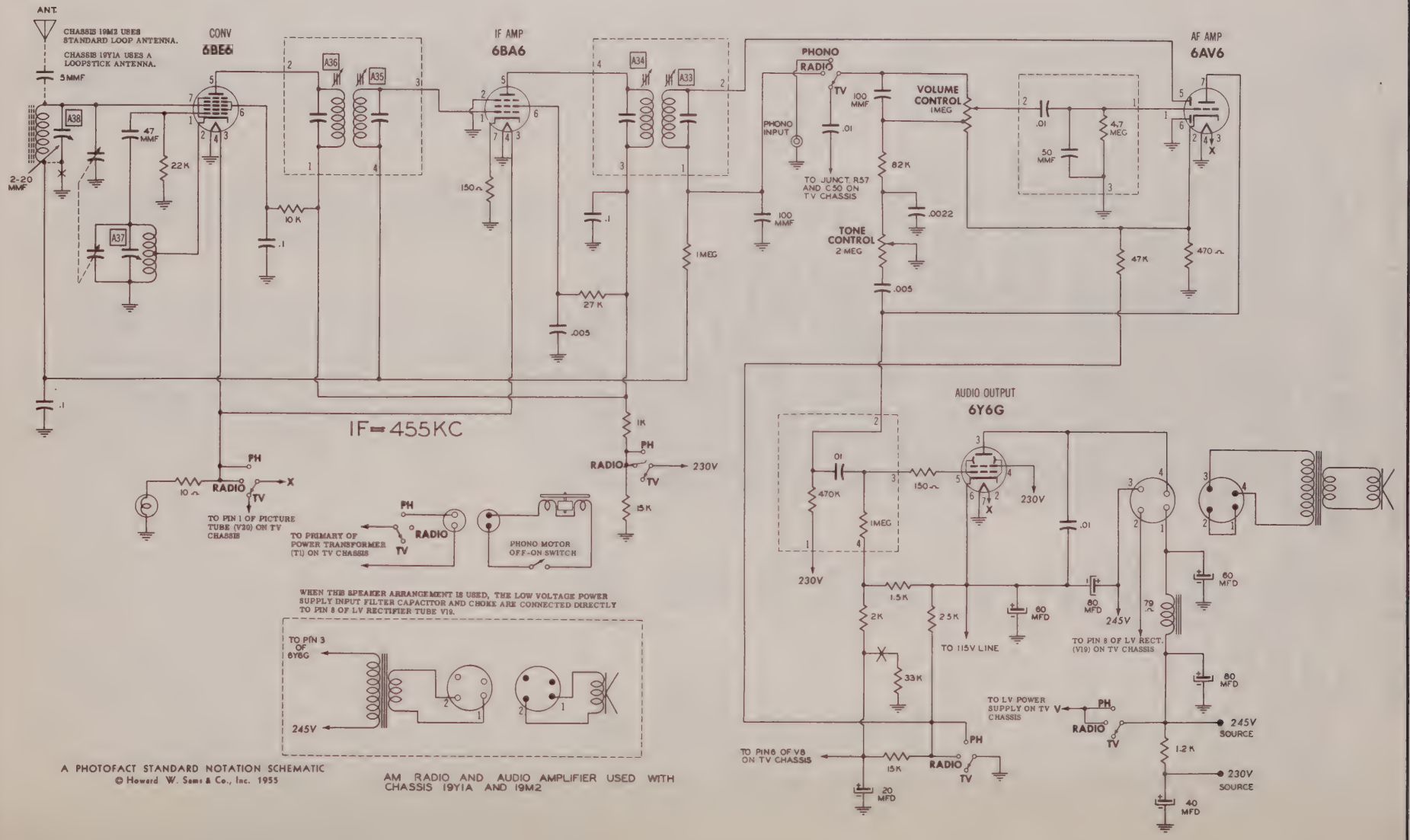
PARTS LIST AND DESCRIPTIONS (Continued)

MISCELLANEOUS (cont)

ITEM No.	PART NAME	ADMIRAL PART No.	NOTES
	Knob	33D107-3	On-off-volume - Models TA2215, TA2216, TA2217, TA2218, CA2215Z, CA2216Z, CA2217Z, CA2236, CA2237, HA2216Z, HA2217Z, LA2215Z, LA2216Z, LA2217Z, TA1812, TA1822, TA2212, TA2222, TA2242
	Knob	33D107-4	On-off-volume - Models KA2216, KA2217, KA2226, KA2227
	Knob	33D107-16	On-off-volume - Models TA1811, TA2211
	Knob	33D107-33	on-off-volume - Models CA2246
	Knob	33D107-1	VHF Channel Selector - Models TA2215, TA2216, TA2217, TA2218, CA2215Z, CA2216Z, CA2217Z, CA2236, CA2237, HA2216Z, HA2217Z, KA2216, KA2217, LA2215Z, LA2216Z, LA2217Z, TA1812, TA1822, TA2212, TA2222, TA2242
	Knob	33D107-15	VHF channel selector - Models TA1811, TA2211
	Knob	33D107-36	VHF channel selector - Models CA2246, KA2226, KA2227
	Knob	33D107-31	UHF channel selector - Models TA2215, TA2216, TA2217, TA2218, CA2215Z, CA2216Z, CA2217Z, CA2236, CA2237, HA2216Z, HA2217Z, KA2216, KA2217, LA2215Z, LA2216Z, LA2217Z, TA1812, TA1822, TA2212, TA2222, TA2242
	Knob	33D107-32	UHF channel selector - Models TA1811, TA2211, CA2246, KA2226, KA2227
	Knob	33D107-6	Contrast - Models TA2215, TA2216, TA2217, TA2218, CA2215Z, CA2216Z, CA2217Z, CA2246, CA2236, CA2237, HA2216Z, HA2217Z, KA2226, LA2215Z, LA2216Z, LA2217Z, TA1812, TA1822, TA2212, TA2222, TA2242, KA2227
	Knob	33D107-19	Contrast - Models TA1811, TA2211
	Knob	33A109-2	UHF - Fine Tuning - Models TA2215, TA2216, TA2217, TA2218, CA2215Z, CA2216Z, CA2217Z, CA2236, CA2237, HA2216Z, HA2217Z, KA2216, KA2217, LA2215Z, LA2216Z, LA2217Z, TA1811, TA1812, TA1822, CA2246, KA2226, KA2227
	Knob	33A114-3	UHF Fine Tuning - Models TA2211, TA2212, TA2222
	Knob	33A109-4	UHF Fine tuning - Model TA2242
	Knob	33A92-3	Vertical Hold - Models 2216, KA2217, KA2226, KA2227
	Knob	A3963	VHF Fine Tuning - All Models
	Knob	33D111-1	Radio-tone - Models LA2215Z, LA2216Z, LA2217Z
	Knob	33D107-7	Radio-tuning - Models KA2216, KA2217
	Knob	33D111-2	Radio-tuning - Models LA2215Z, LA2216Z, LA2217Z
	Knob	33D107-20	Radio-tuning - Models KA2226, KA2227
	Knob	33B90-4	Function Switch - Models KA2216, KA2217, KA2226, KA2227
	Knob	33D111-14	Function Switch - Models LA2215Z, LA2216Z, LA2217Z
	Knob	33D111-13	Volume - Models LA2215Z, LA2216Z, LA2217Z
	Safety Glass	21B71-5	Models TA2215, TA2216, TA2217, TA2218, CA2215Z, CA2216Z, CA2217Z, HA2216Z, HA2217Z, KA2216, KA2217, LA2215Z, LA2216Z, LA2217Z
	Safety Glass	21B71-2	Models CA2236, CA2237
	Safety Glass	21B65-1	Models TA1811, TA1812, TA1822
	Safety Glass	21B65-2	Models TA2212, TA2222
	Safety Glass	21B62-7	Models TA2226, CA2246, KA2226, KA2229
	Safety Glass	21B65-6	Model TA2242
	Mask	23E152-101	Models TA2215, TA2216, TA2217, TA2218, CA2215Z, CA2216Z, CA2217Z, CA2236, CA2237, HA2216Z, HA2217Z, KA2216, HA2217
	Mask	23E152-102	Models LA2215Z, LA2216Z, LA2217Z
	Mask	23D128	Model TA2226
	Mask	23D174-1	Models CA2246, KA2226, KA2227



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AM RADIO AND AUDIO AMPLIFIER USED WITH CHASSIS 19Y1A AND 19M2

RADIO SCHEMATIC

PROPERTY O
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TROUBLE SHOOTING AIDS (cont)

HIGH VOLTAGE

LOSS OF HIGH VOLTAGE

Check by substitution V15, V16, V17 and V18. Check waveform W12.

If Satisfactory	If Unsatisfactory
Check T3, T5A, T6, T7, C77, C78, C79, C75, C76, R98, R97, R96, R94 and other associated components.	Check L29, C74, C72, C70, R86, R85, R90, R3 and other associated components.

INSUFFICIENT HIGH VOLTAGE

Check by substitution V16, V17, and V19. Check adjustments B3, B4 and B5. Check T3, T5A, R96, R94, C74 and other associated components.

BLOOMING

Check by substitution V16, V17, V18 and V19. Check C74, C79, R96, R94, T3 and other associated components.

GENERAL

RASTER , SOUND, NO PICTURE

Follow procedure outlined under "Loss of Video".

RASTER, PICTURE, NO SOUND

Follow procedure outlined under "Weak or No Sound".

RASTER, NO SOUND, NO PICTURE (VHF)

Check by substitution V2, V3, V4, V5, V6, V7 and V8. Check video IF components for failure or change of value.

RASTER, NO SOUND, NO PICTURE (UHF)

Substitute V1. Refer to "Raster, No Sound, No Picture (VHF)".

NO RASTER, NO SOUND

Follow procedure outlined under "Dead Set".

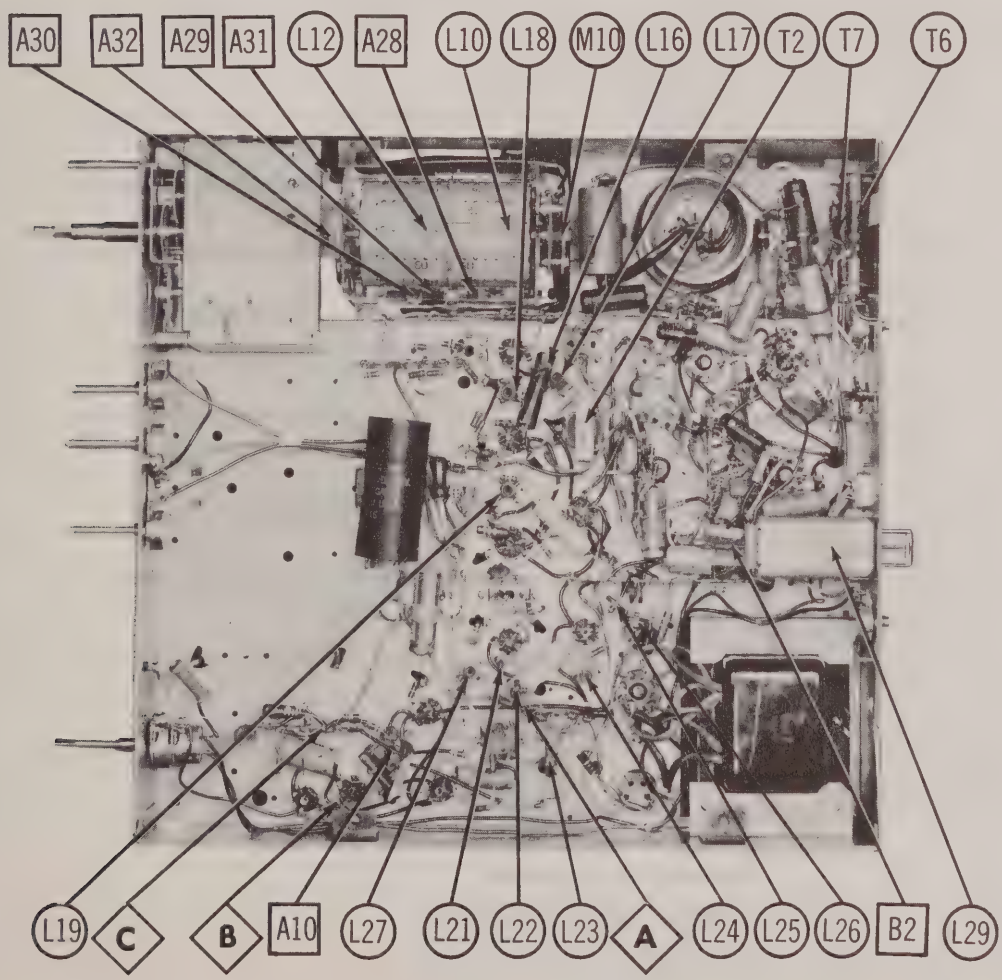
KEYSTONE EFFECT

Check T5 and its associated components.

INTERMITTENT STREAKS

Check high voltage section for corona discharge and arcing.

Symptoms shown are assumed and are not indicative of the quality and workmanship of this equipment.



CHASSIS BOTTOM VIEW-TRANS., INDUCTOR & ALIGN. IDENTIFICATION

ADMIRAL CHASSIS 19L2, 19L2Z, 19M2, 19N2Z, 19S2, 19T1, 19T1C, 19W1, 19W1A, 19W1B, 19W1C, 19Y1A

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the VHF Tuner Oscillator Circuit may be accomplished by removal of the Channel Selector and Fine Tuning knobs. The adjustments are accessible, one at a time, through the small hole in the cabinet to the left of the Channel Selector shaft.

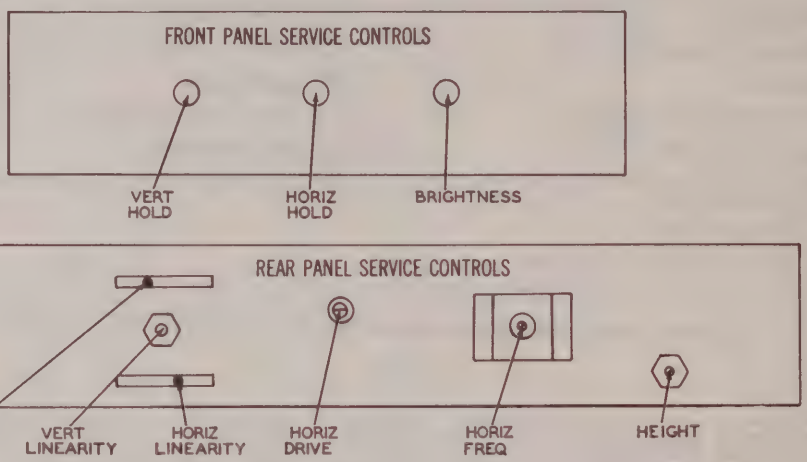
PICTURE TUBE SAFETY GLASS CLEANING

To clean safety glass, remove 4 wood screws holding wood strip at top of safety glass. Remove wood strip and safety glass. Use extreme caution when removing safety glass.

PICTURE TUBE REMOVAL

For picture tube removal it is necessary to remove chassis. (See disassembly instructions.)

SERVICE ADJUSTMENT LOCATION



SPECIAL ADJUSTMENTS--DX RANGE FINDER ADJUSTMENT

In strong signal areas the DX Range Finder control should be set to the "O" position and in medium signal areas as near to the "O" position as possible, consistent with good pictures.

In weak signal areas the DX Range Finder control should be adjusted to the right. It may be necessary to position the control all the way to the "300" position.

If the DX Range Finder control is turned too far to the right on strong signals, the picture may bend or become unstable.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Adjustment of the Horiz. Oscillator Circuit can be made from the rear panel of the chassis. Set the Horiz. Hold Control at the Mid-position of its range and adjust the Horiz. Freq. slug L29 until the picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate Sound IF Detector Buzz, adjust the Ratio Detector Secondary L28 located on bottom of chassis. (See tube placement chart.)

FUSES

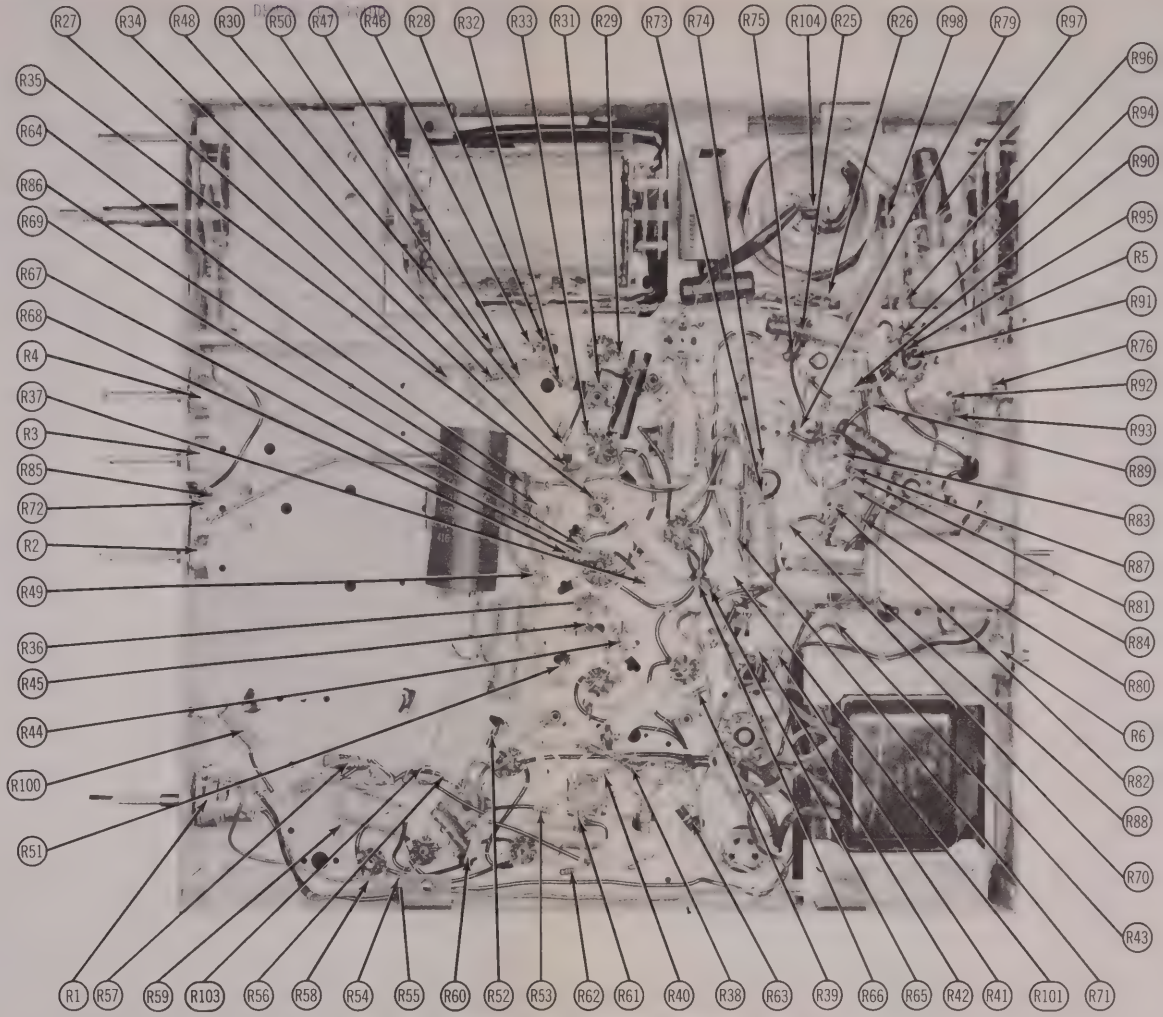
One fuse is used for L. V. Power Supply protection. (For location see Tube Placement Chart.)

CENTERING

Centering is accomplished mechanically by means of a centering lever on the P. M. Focusing assembly. Adjust the centering lever from side to side, and up and down until the picture is properly centered.

DISASSEMBLY INSTRUCTIONS

1. Remove 5 push-on type control knobs and 1 lever from front of cabinet.
2. Remove 10 wood screws, and 2 metal screws. Remove rear cover.
3. Remove speaker plug from socket.
4. Remove 4 chassis bolts. Remove chassis.
5. Remove 4 speaker nuts. Remove speaker.



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

PHOTOFACT* Folder

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MODEL 21-553TMU

ARVIN MODELS 21-550KB, KBU, KM, KMU, 21-551TB, TBU, TM, TMU, 21-552KB, KBU, KM, KMU, 21-553TB, TBU, TM, TMU (Ch. TE379, TE382)

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DATE 2-55 SET 266 FOLDER 2

PHOTOFACT* Folder

*TRADE MARK

ARVIN MODELS
21-550KB, KBU, KM, KMU, 21-551TB, TBU, TM, TMU, 21-552KB, KBU, KM, KMU, 21-553TB, TBU, TM, TMU (Ch. TE379, TE382)

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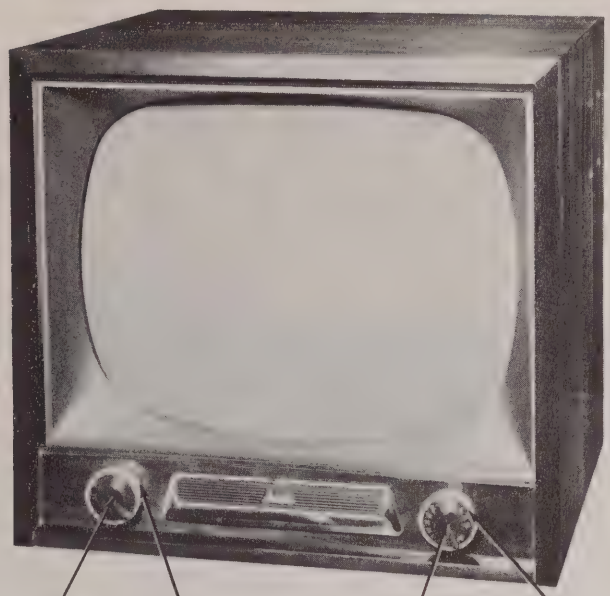

ARVIN MODEL 21-553TMU

TRADE NAME	Arvin	MODELS	CHASSIS
		21-550KB, 21-550KM, 21-551TB, 21-551TM, 21-552KB, 21-552KM, 21-553TB, 21-553TM	TE382
		21-550KBU, 21-550KMU, 21-551TBU, 21-551TMU, 21-552KBU, 21-552KMU, 21-553TBU, 21-553TMU	TE379
MANUFACTURER	Arvin Industries, Inc., Columbus, Indiana		
TYPE SET	Television Receiver		
TUBES	Twenty-one		
POWER SUPPLY	110-120 Volts AC-60 Cycles	RATING 1.84 Amp. @ 117 Volts AC	
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)		

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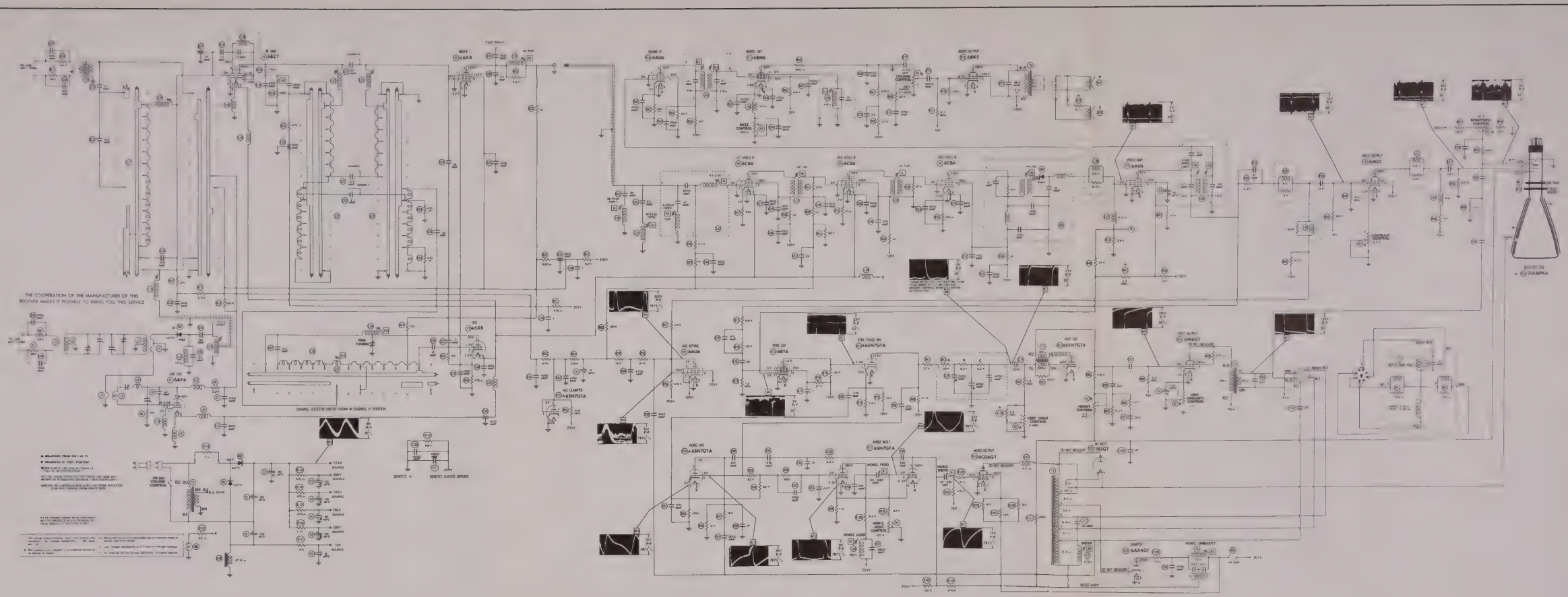
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ARVIN MODELS 21-550KB, KBU, KM, KMU, 21-551TB, TBU, TM, TMU, 21-552KB, KBU, KM, KMU, 21-553TB, TBU, TM, TMU (Ch. TE379, TE382)

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CHASSIS TOP VIEW

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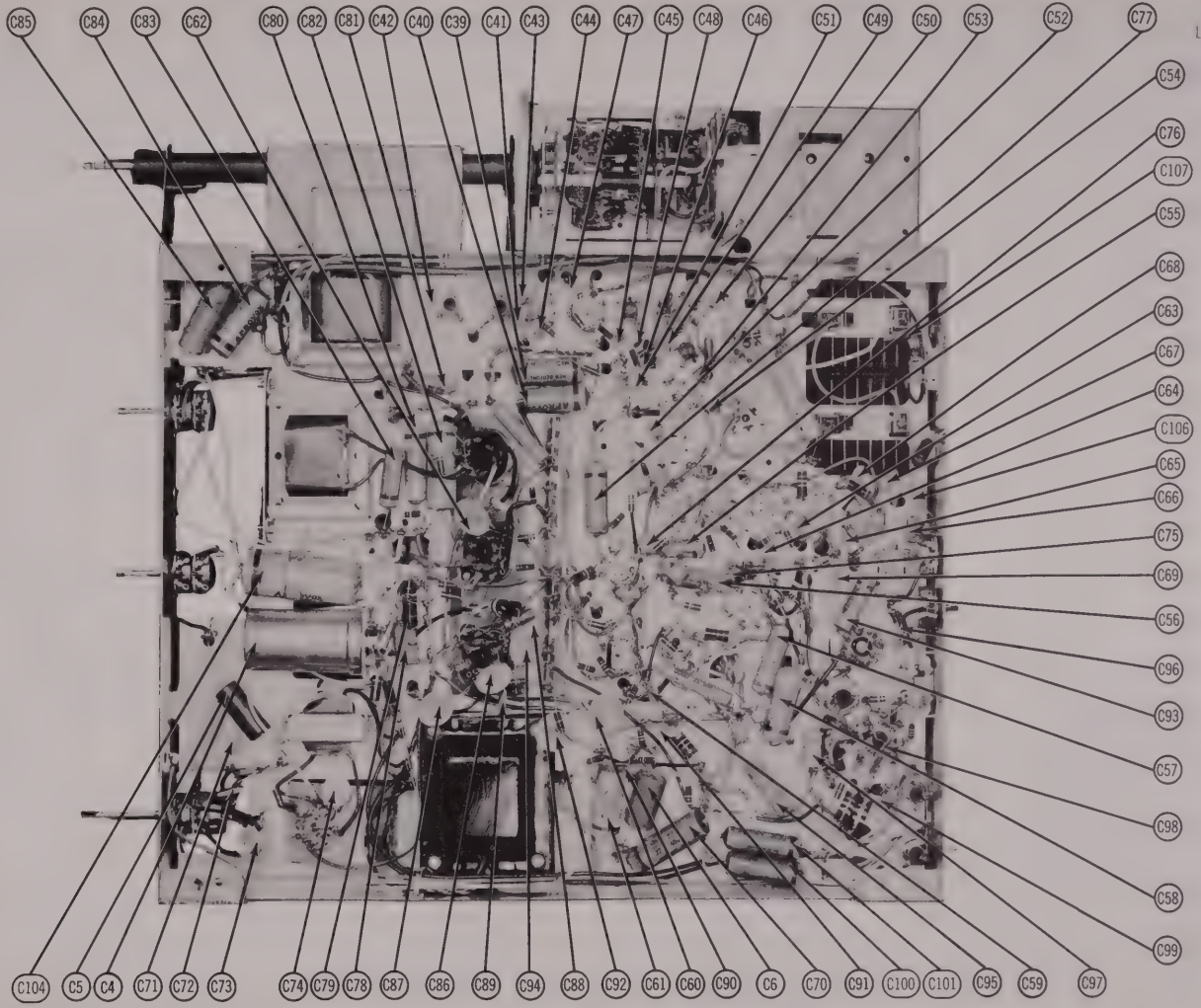

CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

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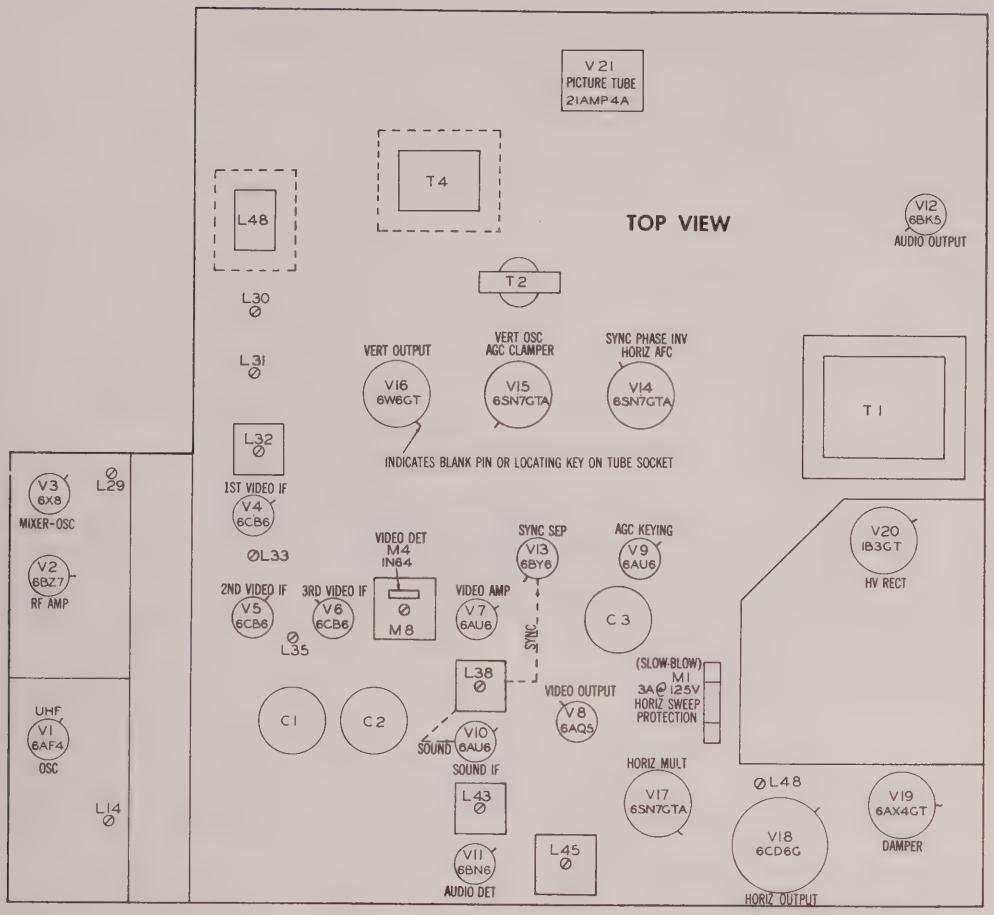
TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - **Selenium Rectifiers (M1 & M2)**

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - **V3, V4, V5, V6, V7 (V1 UHF only)**
No pic, no sound, has snow - **V2, V3, V4**
No pic, has sound, has raster - **V8, V9, V21**
Has pic, no sound - **V10, V11, V12**
Overloaded picture - **V9, V15**

SYNC FAILURE
No vert. sync - **V14, V15**
No horiz. sync - **V14, V17**
No vert. or horiz. sync - **V13, V14**

SWEEP FAILURE
No raster, has sound - **V17, V18, V19, V20, V21, Fuse (M3)**
No vertical deflection - **V15, V16**
Poor vert. linearity or foldover - **V15, V16**
Poor horiz. linearity or foldover - **V17, V18, V19**
Narrow picture - **V17, V18, V19, V20, M1, M2**
Vert. off freq. - **V14, V15**
Horiz. off freq. - **V14, V17**

ARVIN MODELS 21-550KB, KBU, KM, KMU, 21-551TB, TBU, TM, TMU, 21-552KB, KBU, KM, KMU, 21-553TB, TBU, TM, TMU (Ch. TE379, TE382)

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use an isolation transformer to protect the test equipment.
The high voltage lead should be securely taped and kept away from the chassis. Do not remove the horizontal multivibrator tube (V17) to disable the high voltage.

VIDEO IF ALIGNMENT

Remove the AGC keyer tube (V9) from its socket. Connect a 1000Ω potentiometer across a 4.5 volt battery. Connect the potentiometer arm to the ungrounded side of C61. Connect the positive side to chassis. Adjust the potentiometer arm for -2.5 volts at C61.
Attenuate the generator output to maintain not more than 2 volts at VTVM.
To adjust for outer peak (see remarks) turn the core fully counter clockwise then clockwise until the first peak occurs.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over dummy converter tube. Low side to chassis.	39.75MC	9, 10 or 11	DC probe thru 18KΩ to point (A). Common to chassis.	A1	Adjust for MINIMUM deflection.
2.	"	"	47.25MC	"	"	A2	Adjust for MINUMUM deflection on outer peak.
3.	"	"	41.25MC	"	"	A3	"
4.	"	"	42.9MC	"	"	A4	Adjust for maximum deflection.
5.	"	"	45.2MC	"	"	A5	Adjust for maximum deflection on outer peak. Repeat steps 4 and 5.
6.	"	"	42.1MC	"	"	A6	Adjust for maximum deflection on outer peak.
7.	"	"	45.7MC	"	"	A7	"
8.	"	"	44.1MC	"	"	A8	Adjust for maximum deflection. Repeat steps 6, 7 and 8.

OVERALL VIDEO IF RESPONSE CHECK

Adjust the bias supply potentiometer for -3.5 volts at C61.
Connect the high side of an RF signal generator to chassis near V4. Leave the low side disconnected. This generator is to be used to provide markers on the response curve. Use only enough marker and sweep generator output to provide usable indication on scope.
Restore V3 tube shield to its normal position.
Connect a 300MMF capacitor across the vertical input terminals of scope.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	Two 120Ω Carbon Resistors	Across VHF antenna terminals with 120Ω in each lead.	195MC (10MC Swp)	41.25MC 42.25MC 42.75MC 45.0MC 45.75MC 47.25MC	10	Vert. Amp. thru 18KΩ to point (A). Low side to chassis.		Check for response curve similar to Fig. 1. If necessary, SLIGHTLY retouch A4 thru A8 to obtain desired response. Reduce bias to zero and use high scope gain to view 41.25MC and 47.25MC trap response.

SOUND IF ALIGNMENT

Replace V9 in its socket and remove bias battery. Tune in a TV station and reduce signal into set until a hiss is heard in the sound. The signal input may be reduced by inserting an attenuator pad in series with the antenna lead-in and the receiver antenna terminals. If an attenuator pad is not available, disconnect the antenna lead-in and stray feed the signal into the receiver by placing the antenna lead-in near the receiver's antenna terminals.
Adjust the fine tuning control until sound bars just appear on the screen and adjust A9 until the horizontal scanning lines are smooth and continuous. Readjust the fine tuning control for clearest picture and best sound.
Set the buzz control (R4A) to its mid-range position. Adjust the sound take-off coil (A10), the sound IF transformer (A11 and A12) and the quadrature coil (A13) for clearest sound and minimum buzz. If the hiss should disappear during adjustment, reduce the signal input into the receiver until the hiss returns.

SOUND IF ALIGNMENT USING ON THE AIR SIGNAL AND VTVM

Turn the set on and tune in a TV station.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
10.	Not used	Not used	Not used	Tune in any local station	DC probe thru detector (Fig. 2) to pin 2 (grid) of 6BN6 (V11).	A10, A11, A12	Adjust for maximum deflection.
11.	"	"	"	"	Not used	A13	Set buzz control (R4A) to its mid-range position and adjust A13 for maximum sound. SLIGHTLY readjust R4A for MINIMUM buzz.
12.	.01MFD	High side to point (A). Low side to chassis.	4.5MC (Unmod)	Any unused channel	DC probe thru detector (Fig. 2) to pin 2 (grid) of picture tube.	A9	Adjust for MINIMUM deflection.

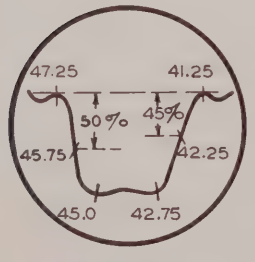


FIG. 1

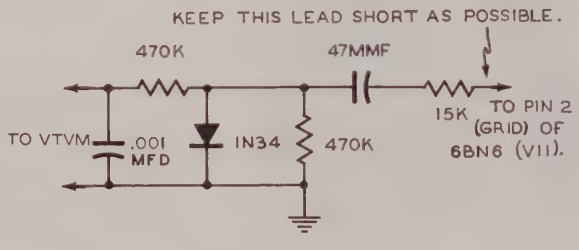


FIG. 2

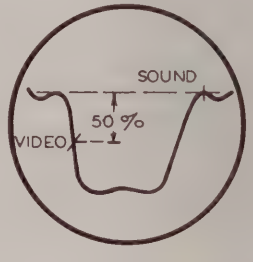


FIG. 3

L. F. [illegible]
3924 MEADE ST.
DENVER, COLORADO

ALIGNMENT INSTRUCTIONS (cont)

OSCILLATOR ALIGNMENT

Connect the bias supply as under "Overall Video IF Response Check". Remove V9 from its socket.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

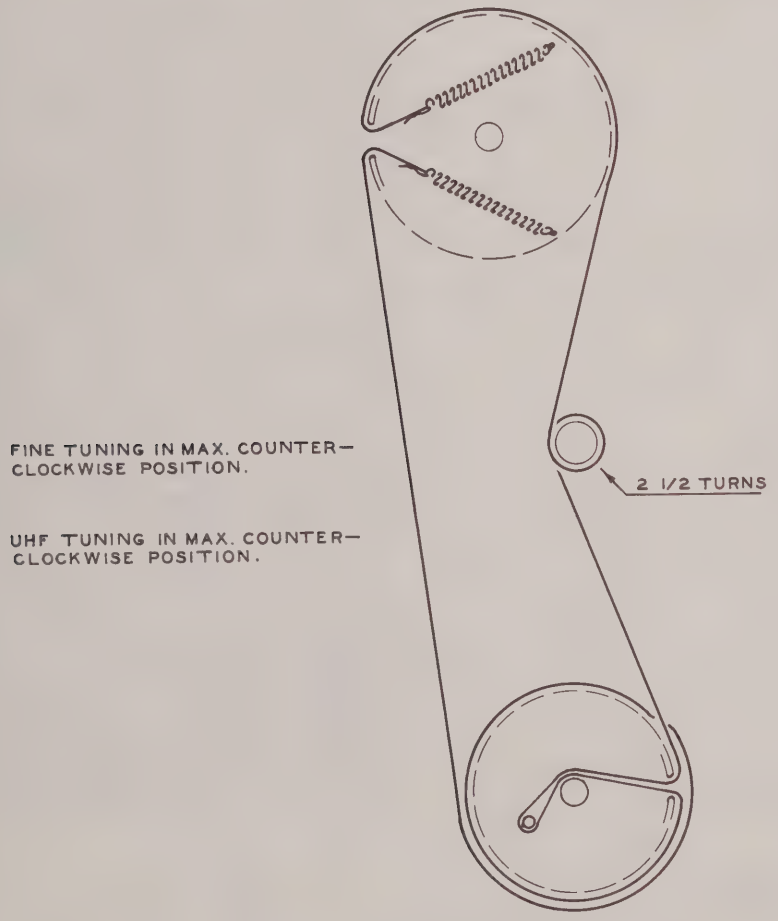
	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
13.	Two 120Ω Carbon Resistors	Across VHF antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. Amp. thru 18KΩ to point (A). Low side to chassis.	A14	Adjust to place sound marker in trap notch as in Fig. 3. Video marker should be at 50%.
14.	"	"	207MC (10MC Swp)	205.25MC 209.75MC	12	"		Check for sound and video marker placement as in Fig. 3. If necessary, make compromise adjustment of A14 for any individual channel. Check all other high band channels to see that they have not been seriously affected.
			201MC (10MC Swp)	199.25MC 203.75MC	11			
			195MC (10MC Swp)	193.25MC 197.75MC	10			
			189MC (10MC Swp)	187.25MC 191.75MC	9			
			183MC (10MC Swp)	181.25MC 185.75MC	8			
			177MC (10MC Swp)	175.25MC 179.75MC	7			
15.	"	"	85MC (10MC Swp)	83.25MC 87.75MC	6	"	A15	Adjust to place sound marker in trap notch as in Fig. 3.
16.	"	"	79MC (10MC Swp)	77.25MC 81.75MC	5	"		Check for sound and video marker placement as in Fig. 3. If necessary, make compromise adjustment of A15 for any individual channel. Recheck all other low band channels to see that they have not been seriously affected.
			69MC (10MC Swp)	67.25MC 71.75MC	4			
			63MC (10MC Swp)	61.25MC 65.75MC	3			
			57MC (10MC Swp)	55.25MC 59.75MC	2			

RF AND MIXER ALIGNMENT

The RF and mixer portion of this receiver has been properly aligned at the factory and is very stable. Alignment of this portion of the receiver should not be required in the field.

UHF TUNER ALIGNMENT

Alignment of this portion of the receiver is not recommended in the field. Should the UHF tuner require major repair or alignment the entire UHF tuner unit should be returned to the factory service department.

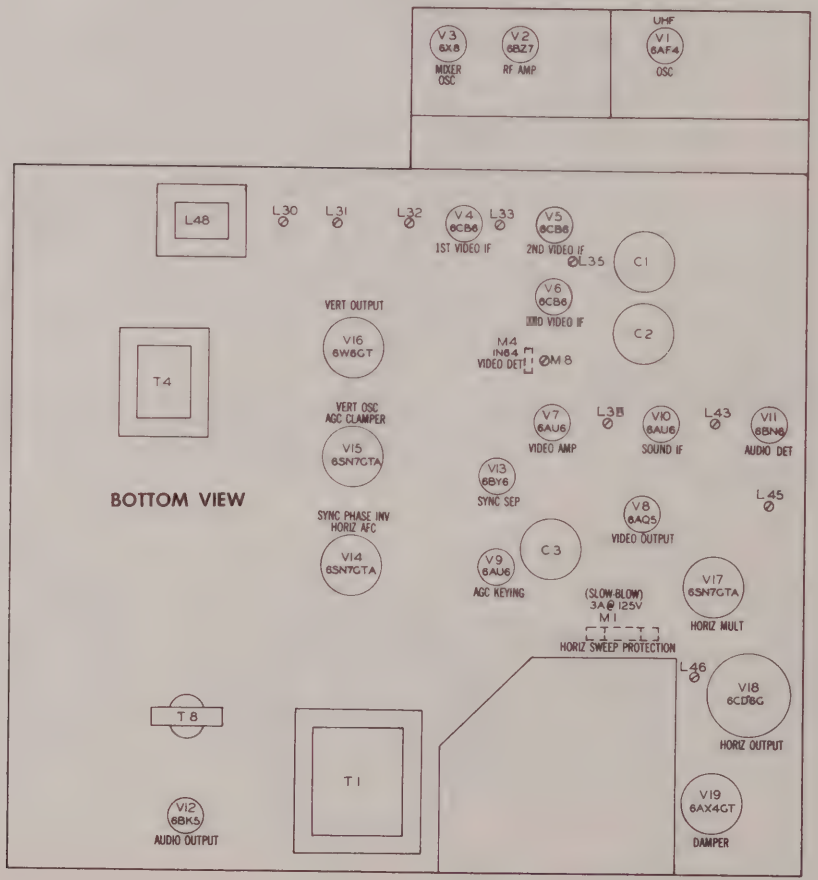


UHF DRIVE CORD STRINGING

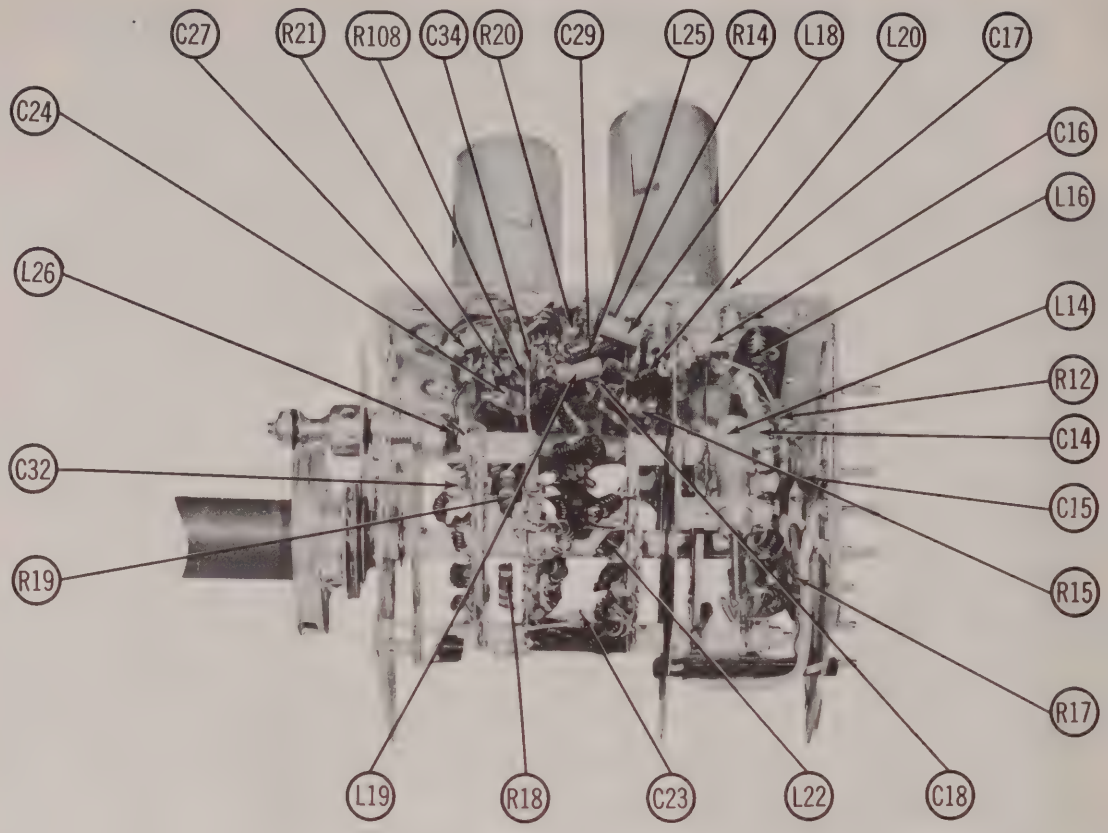
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AF4	†■8. 7KΩ	15KΩ	0Ω	. 1Ω	0Ω	15KΩ	†■8. 7KΩ		
V 2	6BZ7	†L 2KΩ	500KΩ	INF	. 1Ω	0Ω	INF	650KΩ	0Ω	0Ω
V 3	6X8	0Ω	15KΩ	†25KΩ	0Ω	. 1Ω	270Ω	0Ω	†6. 5KΩ	†8KΩ
V 4	6CB6	86KΩ	47Ω	0Ω	. 1Ω	†2. 1KΩ	†2. 1KΩ	0Ω		
V 5	6CB6	83KΩ	47Ω	0Ω	. 1Ω	†2. 1KΩ	†2. 1KΩ	0Ω		
V 6	6CB6	. 1Ω	180Ω	0Ω	. 1Ω	†2. 1KΩ	†2. 1KΩ	0Ω		
V 7	6AU6	4KΩ	0Ω	. 1Ω	0Ω	†6. 6KΩ	†13KΩ	0Ω		
V 8	6AQ5	▲750KΩ	800Ω	0Ω	. 1Ω	†3. 5KΩ	†500Ω	▲750KΩ		
V 9	6AU6	†50KΩ	†1. 1KΩ	0Ω	. 1Ω	300KΩ	†0Ω	†1. 1KΩ		
V 10	6AU6	1. 8Ω	0Ω	0Ω	. 1Ω	†18KΩ	†18KΩ	330Ω		
V 11	6BN6	700Ω	2. 8Ω	0Ω	. 1Ω	†7KΩ	4. 6Ω	†320KΩ		
V 12	6BK5	†750Ω	INF	800KΩ	. 1Ω	0Ω	0Ω	800KΩ	†500Ω	INF
V 13	6BY6	50KΩ	0Ω	0Ω	. 1Ω	†150KΩ	†30KΩ	1. 5Meg		
V 14	6SN7GTA	†150KΩ	†5. 8KΩ	3. 9KΩ	350KΩ	15KΩ	150KΩ	. 1Ω	0Ω	
V 15	6SN7GTA	600KΩ	600KΩ	0Ω	1. 7Meg	†1. 8Meg	0Ω	. 1Ω	0Ω	
V 16	6W6GT	INF	. 1Ω	†700Ω	†1KΩ	▲2. 2Meg	1Ω	0Ω	800Ω	
V 17	6SN7GTA	1. 3Meg	†8. 2KΩ	1. 1KΩ	140KΩ	†120KΩ	1. 1KΩ	. 1Ω	0Ω	
V 18	6CD6G	INF	. 1Ω	0Ω	▲0Ω	▲470KΩ	†120KΩ	0Ω	†6KΩ	Top Cap ◓8. 5Ω
V 19	6AX4GT	†16Ω	INF	650KΩ	INF	†30Ω	INF	0Ω	. 1Ω	
V 20	1B3GT	PINS 1-8 HAVE INFINITE RESISTANCE								Top Cap ◓325Ω
V 21	21AMP4A	0Ω	470KΩ	Pin 10 ◓470KΩ	Pin 11 †180KΩ	Pin 12 †. 1Ω				

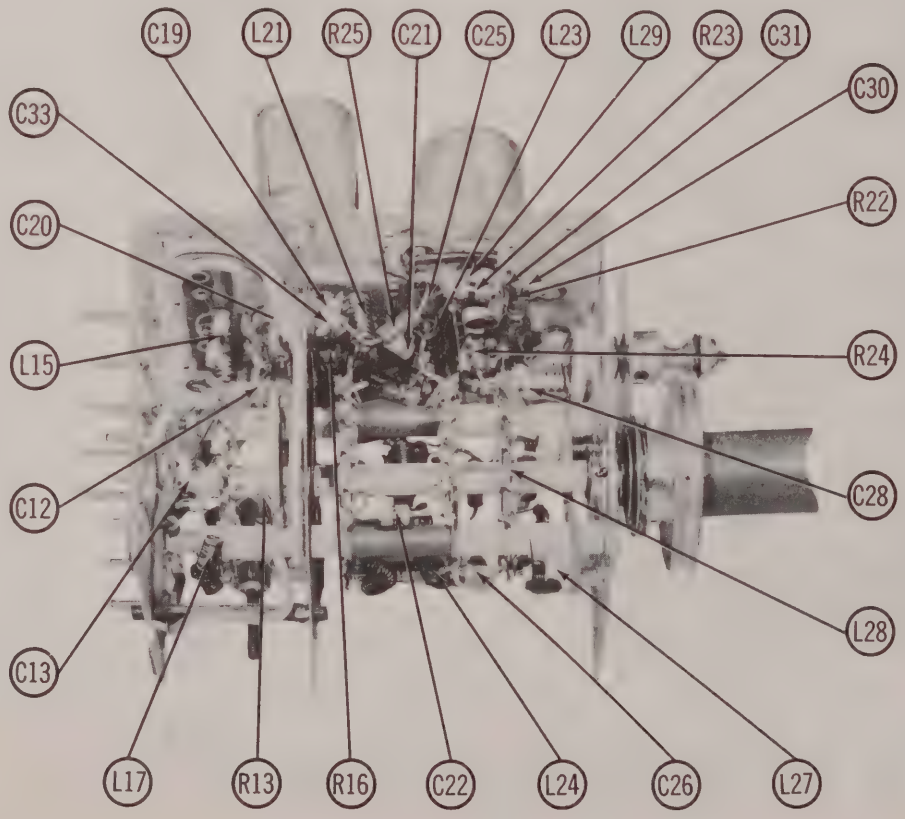
† MEASURED FROM OUTPUT OF M2.
■ MEASURED IN "UHF" POSITION.
▲ MEASURED FROM -16V LINE.
ALL MEASUREMENTS IN "VHF" POSITION UNLESS OTHERWISE DESIGNATED:
◓ MEASURED FROM PIN 3 OF V19.



TUBE PLACEMENT CHART



RF TUNER-RIGHT SIDE



RF TUNER-LEFT SIDE

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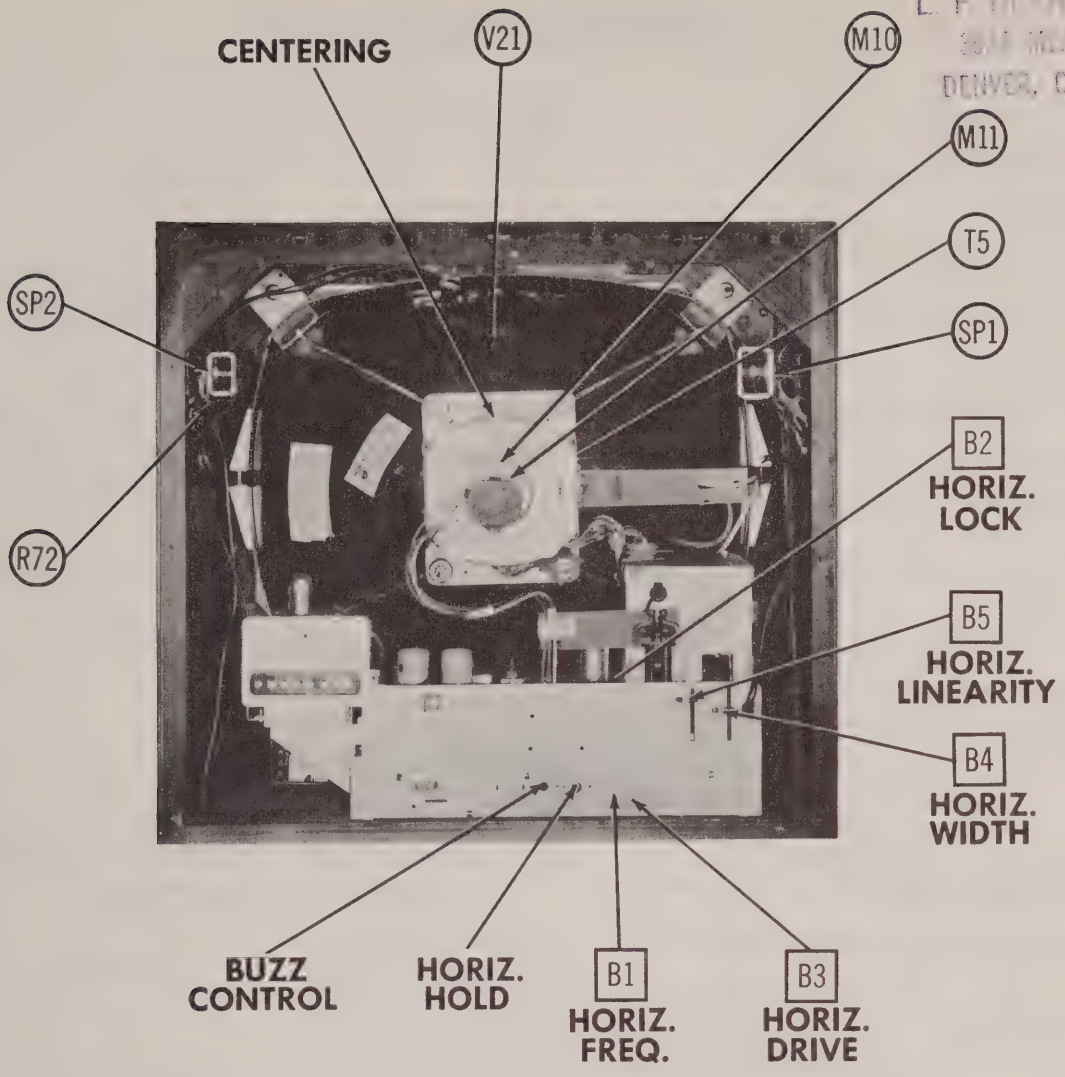
DENVER, COLORADO



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

① Set the horizontal hold control to its mid-range position.

② Connect a short jumper across the horizontal oscillator coil (L46).

③ Connect the DC probe of VTVM to grid (pin 4) of 6SN7 (V17). Connect common to chassis. Adjust horizontal frequency (B1) for zero volts at VTVM.

④ Remove jumper across L46 and adjust horizontal lock (B2) for zero volts at VTVM. Remove VTVM.

⑤ If picture does not lose sync at extreme settings of horizontal hold control slight readjustment of B1 may be necessary.

Turn the horizontal drive trimmer (B3) clockwise as far as possible without the presence of a vertical white line near the center of the raster.

Simultaneously adjust the width (B4) and horizontal linearity (B5) for a picture that is symmetrical from left to right and slightly wider than necessary to fill the picture mask horizontally.

TROUBLE SHOOTING AIDS

SWEEP

HORIZONTAL

LOSS OF SWEEP

Follow procedure outlined under "Loss of High Voltage".

INSUFFICIENT SWEEP

Check by substitution V18 and V19. Check M1 and M2. Check adjustments B3, B4 and B5. Check T3, T5A, R106, R107, R108 and other associated components.

DRIVE LINES

Check by substitution V18 and V19. Check adjustments B3 and B5. Check C98, R103, R107, R106, R108 and other associated components.

COMPRESSED LEFT SIDE

Check by substitution V18 and V19. Check horizontal output and damper stages for component failure or change of value.

FOLDS

Follow procedure outlined under "Drive Lines".

PIE CRUST EFFECT

Check by substitution V17, V18 and V19. Check C93 for open. Check R99, C96 and other associated components.

XMAS TREE EFFECT

Check by substitution V17, V18 and V19. Check T3 and T5A for internal arcing. Check L46, C97, R100, R102 and other associated components.

VERTICAL

LOSS OF SWEEP

Check by substitution V15 and V16. Check waveform W10.

If Satisfactory	If Unsatisfactory
Check T4, T5B, C83, C4C, R89, R2B and other associated components.	Check C82, T2, R85, R3B and other associated components.

INSUFFICIENT SWEEP

Check by substitution V15 and V16. Check height and vertical linearity controls for proper operation. Check T4 and T5B.

COMPRESSED AT BOTTOM

Check by substitution V15 and V16. Check T2, R85, R3B, C82 and other associated components.

COMPRESSED AT TOP

Check by substitution V15 and V16. Check C82, C4C, T4, R2B and other associated components.

FOLDS

Check by substitution V15 and V16. Check T4, T5B, C82, C80, C81, R86, R87 and other associated components.

SYNC

LOSS OF VERTICAL AND HORIZONTAL SYNC

Check by substitution V13 and V14. Check C75, C76, C77, R75, R74, R80 and other associated components.

LOSS OF VERTICAL SYNC - HORIZONTAL SYNC SATISFACTORY

Substitute V15. Check waveform W8.

If Satisfactory	If Unsatisfactory
Check T2, R84, R2A and other associated components.	Check vertical integrator network and C79. Check video IF alignment for overloading.

LOSS OF HORIZONTAL SYNC - VERTICAL SYNC SATISFACTORY

Check by substitution V14 and V17. Check horizontal AFC network. Check L46, C97, R5, R101 and other associated components.

HORIZONTAL BENDING

Check by substitution V9, V13, V14 and V15. Check horizontal AFC network.

VIDEO

LOSS OF VIDEO

Check by substitution V7 and V8. Check C56, C57, R46, R43, L40, L39 and other associated components.

SOUND BARS (4.5MC Beat)

Adjust tuner fine tuning for best sound and picture. Check adjustment A9. Check video IF alignment.

POOR CONTRAST

Check by substitution V7 and V8. Check video crystal detector network. Check contrast control, picture tube, C57 and other associated components.

NEGATIVE PICTURE

Check by substitution V7 and V8. Check picture tube, C57, L37, L39, L40 and R39. Check video crystal detector network.

SMEAR

Check by substitution V7 and V8. Check L37, L36, L39, L40, L42 and other associated components.

WIDE BLACK BAR ACROSS PICTURE

Check by substitution V2, V4, V5, V6, V7 and V8 for heater to cathode leakage.

AUDIO

WEAK OR NO SOUND

Check by substitution V10, V11 and V12. Check stage V12 using audio signal generator. Apply audio signal across R1B.

If Satisfactory	If Unsatisfactory
Check detector and audio IF stages for component failure or change of value.	Check C73, C74, T8, speaker and other associated components.

BUZZ

Adjust tuner fine tuning for best sound and picture. Check adjustments R4 and A13 for minimum buzz. If still unsatisfactory, check audio IF alignment.

DISTORTED

Follow procedure outlined under "Weak or No Sound".

POWER

DEAD SET

If filaments fail to light, check AC interlock assembly. Check switch on volume control and T1. If filaments light, check R118, M1 and M2. Check B+ filter and decoupling network for failure or change of value.

SMALL AND/OR DIM PICTURE

Check M1 and M2. Check R118. Check B+ filter and decoupling network.

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA: ARVIN PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RETMA BASE TYPE	NOTES
V1	UHF Oscillator	6AF4	6AF4	7DK	
V2	RF Amplifier	6BZ7	6BZ7	9AJ	
V3	Mixer - Osc.	6X8	6X8	9AK	
V4	1st. Video IF Amp.	6CB6	6CB6	7CM	
V5	2nd. Video IF Amp.	6CB6	6CB6	7CM	
V6	3rd. Video IF Amp.	6CB6	6CB6	7CM	
V7	Video Amplifier	6AU6	6AU6	7CK	
V8	Video Output	6AQ5	6AQ5	7BZ	
V9	AGC Keying	6AU6	6AU6	7BK	
V10	Sound IF Amp.	6AU6	6AU6	7BK	
V11	Audio Detector	6BN6	6BN6	7DF	
V12	Audio Output	6BK5	6BK5	9BQ	
V13	Sync Separator	6BY6	6BY6	7CH	
V14	Sync Phase Inv.-Horiz. AFC	6SN7GTA	6SN7GTA	8BD	
V15	Vert. Oscillator-AGC Clamper	6SN7GTA	6SN7GTA	8BD	
V16	Vert. Output	6W6GT	6W6GT	7S	
V17	Horiz. Mult.	6SN7GTA	6SN7GTA	8BD	
V18	Horiz. Output	6CD6G	6CD6G	7BT	
V19	Damper	6AX4GT	6AX4GT	4CG	
V20	HV Rectifier	1B3GT	1B3GT	3C	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA: ARVIN PART No.	CBS-HYTRON PART No.	GENERAL ELECTRIC PART No.	SYLVANIA PART No.	WESTINGHOUSE PART No.	RETMA BASE TYPE	NOTES
V21	21AMP4A 21AMP4	21AMP4A 21AMP4		21AMP4A 21AMP4 21ACP4 21ACP4A	21AMP4A 21AMP4	12N 12N 12N 12N	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: ARVIN PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1	150	150	22422-26	AFHS1-70		XA004		FP117	TVC-3442	
C2	150	150	22422-26	AFHS1-70		XA004		FP117	TVC-3442	
C3A	▲80	300	22422-24	AFH4-07				FP333.8	TVL-4641	
B	■60	300		PRS450/50				TC68	TVA-1608	
C	▲20	300								
D	10	300								
C4A	▲80	300	22422-25	AFH3-122		C036		FP333.2	TVL-4630	
B	■40	300				BRH501				
C	▲100	50								
C5	10	50	42008	PRS50/10		BR105		TC32	TVA-1304	
C6	2	150	41534	PRS150/4		BR245		TC40	TVA-1301	
C7	1000			BPD-001	DD-102	K069	801-001	DC-511	5HK-S1	
C8	1.5									
C9	22				TCN-22	TN06				
C10	82			SI82	D6-820	TZ28	GP1K-820		5GA-Q82	
C11	1000			BPD-001	DD-102	K069	801-001	DC-511	5HK-S1	
C12	15			SI15	D6-150	TP11	GP1K-150	UC-5415	5GA-Q15	
C13	0.8									
C14	470			SI470NP0						
C15	1000			BPD-001	DD-102	K069	801-001	DC-511	5HK-S1	
C16	1.2						NP0K-1R2			
C17	10									
C18	1000			EF-001	MFT-1000				503C-D1	
C19	1000			EF-001	MFT-1000				503C-D1	
C20	1000			EF-001	MFT-1000				503C-D1	
C21	47			SI47	D6-470	TP29	GP1K-470	UC-5447	5TCU-Q47	
C22	0.3									
C23	2									
C24	.56									
C25	1000			BPD-001	DD-102	K069	801-001	DC-511	5HK-S1	
C26	1.8									
C27	1.5									
C28	10									
C29	1000			BPD-001	DD-102	K069	801-001	DC-511	5HK-S1	
C30	4.7			SI4.7NP0	TCZ-4.7	TZ07	NP0K-4R7	ZT-5547	5TCCB-V47	
C31	1000			BPD-001	DD-102	K069	801-001	DC-511	5HK-S1	
C32	2.2			SI2.2NP0	TCZ-2.2	TZ05	NP0K-2R2		5TCCB-V22	
C33	1000			EF-001	MFT-1000				503C-D1	
C34	1000			BPD-001	DD-102	K069	801-001	DC-511	5HK-S1	
C35	1000	1500		HVD15-001	DD30-102	MCD1	IR5KV-102	MCK210	20GA-D1	
C36	1000	1500		HVD15-001	DD30-102	MCD1	IR5KV-102	MCK210	20GA-D1	
C37	1000	1500		HVD15-001	DD30-102	MCD1	IR5KV-102	MCK210	20GA-D1	
C38	1000	1500		HVD15-001	DD30-102	MCD1	IR5KV-102	MCK210	20GA-D1	
C39	.1	400		P488-1	DF-104	CUB4P1		PT401	4TM-P1	
C40	.1	400		P488-1	DF-104	CUB4P1		PT401	4TM-P1	
C41	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C42	20		40355-13							
C43	22		40355-15							
C44	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C45	470			BPD-00047	D6-471	K060	831-471	UC-5347	5GA-T47	
C46	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C47	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C48	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C49	470			BPD-00047	D6-471	K060	831-471	UC-5347	5GA-T47	
C50	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C51	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C52	470			BPD-00047	D6-471	K060	831-471	UC-5347	5GA-T47	
C53	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C54	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C55	47			N750K-470	TCN-470	TN14	N750K-470	NT-5447	5TCU-Q47	
C56	.047	400		P488-047	DF-503	CUB4S47		PT4147	4TM-S47	
C57	.047	400		P488-047	DF-503	CUB4S47		PT4147	4TM-S47	
C58	.1	400		P488-1	DF-104	CUB4P1		PT401	4TM-P1	

PROPERTY OF
L. F. BLANKENSHIP
3924 M ST.
DENVER, COLORADO

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (cont)

ITEM No	RATING CAP	RATING VOLT	ARVIN PART No.	AEROVOX PART No.	CENTRALAB, CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C59	1000	1000		HVDi5-001	DDi6-103	VD1	IR5KV-103	MCK210	10GA-D1
C60	4700			BPD-0047	DD-472	K079	801-0047	DC-5347	5HK-D47
C61	.33	300		P285-33		P33P23		PT4033	2TM-P33
C62	4700			BPD-0047	DD-472	K079	801-0047	DC-5347	5HK-D47
C63	4700			BPD-0047	DD-472	K079	801-0047	DC-5347	5HK-D47
C64	4700			BPD-0047	DD-472	K079	801-0047	DC-5347	5HK-D47
C65	10000			BPD-01	DD-103	K082	81L-01	DC-511	5HK-S1
C66	10000			BPD-01	DD-103	K082	81L-01	DC-511	5HK-S1
C67	10000			BPD-01	DD-103	K082	81L-01	DC-511	5HK-S1
C68	4700			BPD-0047	DD-472	K079	801-0047	DC-5347	5HK-D47
C69	1000			BPD-001	DD-103	K069	801-001	DC-531	5HK-D1
C70	.22	400		P488-22		CUB4P22		PT4022	4TM-P22
C71	4700			BPD-0047	DD-472	K079	801-0047	DC-5347	5HK-D47
C72	10000			BPD-01	DD-103	K082	81L-01	DC-511	5HK-S1
C73	10000			BPD-01	DD-103	K082	81L-01	DC-511	5HK-S1
C74	1900	1000		P1088-004	DGiE-401	CUB1ED4		PT1E24	4EB-D4
C75	470			BPD-00047	D6-471	K060	831-471	UC-5347	5GA-T47
C76	.01	600		P488-01	DD-103	CUB3S1	GP2-333-103	PT611	6TM-S1
C77	.1	400		P488-1	DF-104	CUB4P1		PT401	4TM-P1
C78A	2300							DC-523	
B	4700		#34166	#PA-120	#PC-100	#1E7M1	#1408-01	DC-531	#V-1
C	4700							DC-525	
C79	.0047	600		P688-0047	D6-472	CUB6D47	GP2-333-472	PT6247	6TM-D47
C80	.047	600		P688-047	DF-503	CUB6F47		PT6347	6TM-F47
C81	.023	300		P285-023		P23E23		PT4123	2TM-S23
C82	.1	600		P688-1	DF-104	CUB6P1		PT601	6TM-P1
C83	.047	300		P285-047	DF-503	P47E47		PT4747	2TM-S47
C84	.1	400		P488-1	DF-104	CUB4P1		PT401	4TM-P1
C85	.1	400		P488-1	DF-104	CUB4P1		PT401	4TM-P1
C86	470			BPD-00047	D6-471	K060	831-471	UC-5347	5GA-T47
C87	470			BPD-00047	D6-471	K060	831-471	UC-5347	5GA-T47
C88	370			S2T70N750	TCN-270	N053	N750-337-271		
C89	100			BPD-0001	D6-101	G042	GP1K-101	UC-531	5GA-T1
C90	.02	600		P688-01	DD-103	CUB6S1	GP2-333-103	PT611	6TM-S1
C91	2000			BPD-002	DD-202	K072	801-002	DC-532	5HK-D2
C92	4700			BPD-0047	D6-472	K079	801-0047	DC-5347	5HK-D47
C93	.047	300		P285-047	DF-503	P47E47		PT4747	2TM-S47
C94	270			S2T70N750	TCN-270	N053	N750-337-271		
C95	.01	600		P688-01	D6-103	CUB6S1	GP2-333-103	PT611	6TM-S1
C96	100			S1J00N750	TCN-100	N045	N750L-101	NT-531	STCU-T1
C97	3900			1467-004		IR5D39		MCK463	MS-24
C98	330			S1J33N750			N750-333-331		STCU-T33
C99	4700			BPD-0047	D6-472	K079	801-0047	DC-5347	5HK-D47
C100	.047	600		P688-047		CUB6S47		PT6347	6TM-S47
C101	.047	600		P688-047		CUB6S47		PT6347	6TM-S47
C102	.22	400		P488-23		CUB4P22		PT4022	4TM-P22
C103	150	5000	40538						
C104	.47	600		S84-47		CUB6P47		PT6047	6TM-P47
C105	120	2000							
C106	10000	1500				DD1E-103			20HK8-S1
C107	10000	1500				DD1E-103			20HK8-S1
C108	1000			BPD-001	DD-103	K069	801-001	DC-531	5HK-D1

* Items C78A, C78B, C78C, R82A, R82B and R82C are combined in one unit.

CONTROLS

ITEM No	RATING RESIST-ANCE	RATING WATTS	ARVIN PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	100KΩ	½	N32464-54		RTV-490			Brightness (Panel)
B	1Meg	½						Volume (Rear) Tapped at 200KΩ
C	Switch							Attach to R1B
R2A	2Meg	½	N32464-57	*QJ-500	RTV-492	P1-57	UP-2SL	Vert. Hold (Panel)
B	3000Ω	½				R2-18	UR252R	Vert. Linearity (Rear)
R3A	2500Ω	½	N32464-56	*QJ-504	RTV-49R	P1-16	UP252R	Contrast (Panel)
B	2.5Meg	½				R2-76	UR255L	Height (Rear)
R4A	500Ω	½	N6140-1	Q11-103	A47-500-S	AB-4		Buzz
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1		Attach to R4A
R5A	100KΩ	½	N6140-3	Q11-123	A47-100K-S	AB-40	U41	Horiz. Hold
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R5A

† Universal replacement (Mallory exact duplicate part no. UR-250)
‡ Universal replacement (Mallory exact duplicate part no. UR-1725)
* CONCENTRIKIT EQUIVALENT: KIT K-3, BASE ELEMENTS & SHAFTS B11-139 & P1-103 (PANEL)
B17-112 & R11-108 (REAR)
♦ CONCENTRIKIT EQUIVALENT: KIT K-3, BASE ELEMENTS & SHAFTS B17-111 & P1-102 (PANEL)
B11-239 & R11-108 (REAR)

RESISTORS

ITEM No.	RATING OHMS	RATING WATT	ARVIN PART No.	IRC PART No.	NOTES
R6	68KΩ	2		BTB-68K	
R7	68KΩ	2		BTB-68K	
R8	15KΩ	½		BTS-15K	
R9	2200Ω	1		BTA-2200	
R10	68KΩ	2		BTB-68K	
R11	68KΩ	2		BTB-68K	
R12	15KΩ	½		BTS-15K	
R13	100KΩ	½		BTS-100K	
R14	1Meg 5%	½		BTS-1Meg 5%	
R15	750KΩ 5%	½		BTS-750K 5%	
R16	470Ω	½		BTS-470	
R17	3300Ω	½		BTS-3300	
R18	470Ω	½		BTS-470	
R19	470Ω	½		BTS-470	
R20	270Ω	½		BTS-270	
R21	15KΩ	½		BTS-15K	
R22	3600Ω 5%	½		BTS-3600 5%	
R23	100Ω	½		BTS-1000	
R24	15KΩ	½		BTS-15K	
R25	620Ω 5%	½		BTS-620 5%	
R26	2700Ω	½		BTS-2700	
R27	470 5%	½		BTS-47 5%	
R28	1000Ω	½		BTS-1000	
R29	1000Ω	½		BTS-1000	
R30	1000Ω	½		BTS-1000	
R31	27KΩ 5%	½		BTS-27K 5%	
R32	470 5%	½		BTS-47 5%	
R33	1000Ω	½		BTS-1000	
R34	27KΩ 5%	½		BTS-27K 5%	
R35	180Ω	½		BTS-180	
R36	1000Ω	½		BTS-1000	
R37	3600Ω 5%	½		BTS-3600 5%	
R38	12KΩ	½		BTS-12K	
R39	22000 5%	½		BTS-2200 5%	
R40	47KΩ	½		BTS-47K	
R41	3.3Meg 5%	½		BTS-3.3Meg 5%	Note 1
R42	47KΩ	½		BTS-47K	

RESISTORS (cont)

ITEM No.	RATING OHMS	RATING WATT	ARVIN PART No.	IRC PART No.	NOTES
R43	3300Ω 5%	½		BTS-3300 5%	
R44	3.3Meg 5%	½		BTS-3.3Meg 5%	
R45	820KΩ 5%	½		BTS-820K 5%	
R46	3000Ω 5%	4		PW4-3000 5%	
R47	130KΩ	½		BTS-130K	
R48	22KΩ	½		BTS-22K	
R49	100KΩ	½		BTS-100K	
R50	470KΩ	½		BTS-470K	
R51	470Ω	4		PW4-470	
R52	6500Ω 5%	4		PW4-6500 5%	
R53	47KΩ	½		BTS-47K	
R54	330KΩ 5%	½		BTS-330K 5%	
R55	6.8Meg 5%	½		BTS-6.8Meg 5%	
R56	470KΩ 5%	½		BTS-470K 5%	
R57	47KΩ	½		BTS-47K	
R58	47KΩ	½		BTS-47K	
R59	12KΩ	½		BTS-12K	
R60	180KΩ 5%	½		BTS-180K 5%	
R61	82KΩ 5%	½		BTS-82K 5%	
R62	330Ω	½		BTS-330	
R63	12KΩ	1		BTA-12K	
R64	22KΩ	1		BTA-22K	
R65	6800Ω	1		BTA-6800	
R66	680Ω	1		BTA-680	
R67	270KΩ	½		BTS-270K	
R68	47KΩ	½		BTS-47K	
R69	82KΩ	½		BTS-82K	
R70	1Meg 5%	½		BTS-1Meg 5%	
R71	2.7Meg 5%	½		BTS-2.7Meg 5%	
R72	10Ω	½		BTS-10	Note 3
R73	1.5Meg	½		BTS-1.5Meg	
R74	27KΩ 5%	1		BTA-27K 5%	
R75	150KΩ	½		BTS-150K	
R76	150KΩ	½		BTS-150K	
R77	6800Ω	½		BTS-6800	
R78	10KΩ	1		BTA-10K	
R79	3900Ω	2		BTB-3900	
R80	4700Ω	½		BTS-4700	
R81	27KΩ	½		BTS-27K	

ITEM No.	RATING OHMS	RATING WATT	ARVIN PART No.	IRC PART No.	NOTES
R82A	22KΩ	½	#34166	BTS-22K	
B	8200Ω	½		BTS-8200	
C	8200Ω	½		BTS-8200	
R83	470KΩ	½		BTS-470K	
R84	1.2Meg 5%	½		BTS-1.2Meg 5%	
R85	470KΩ	½		BTS-470K	
R86	12000Ω	½		BTS-12000	
R87	82000 5%	½		BTS-8200 5%	
R88	2.2Meg	½		BTS-2.2Meg	
R89	470Ω	½		BTS-470	
R90	12KΩ	½		BTS-12K	
R91	560Ω	½		BTS-560	
R92	560Ω	½		BTS-560	
R93	82KΩ 5%	½		BTS-82K 5%	
R94	82KΩ 5%	½		BTS-82K 5%	
R95	150KΩ	½		BTS-150K	
R96	15KΩ	½		BTS-15K	
R97	18KΩ	2		BTB-18K	
R98	1Meg	2		BTB-1Meg	
R99	1000 5%	½		BTS-1000 5%	
R100	68KΩ	½		BTA-68K	
R101	82KΩ	½		BTS-82K	
R102	150KΩ	½		BTS-150K	
R103	8200Ω 5%	½		BTS-8200 5%	
R104	470KΩ	½		BTS-470K	
R105	47Ω	½		BTS-47	
R106	18KΩ	2		BTB-18K	
R107	18KΩ	2		BTB-18K	
R108	18KΩ	2		BTB-18K	
R109	10Ω	½		BTS-10	
R110	470KΩ	½		BTS-470K	
R111	470KΩ	½		BTS-470K	
R112	22Ω	½		BTS-22	
R113	470Ω	½		BTA-470	
R114	470Ω	1		BTA-470	
R115	470Ω	1		BTA-470	
R116	1000Ω 5%	10	N42165-113		
R117	10KΩ	½		BTS-10K	
R118	5Ω	½	N41853		
R119	68KΩ	2		BTB-68K	
R120	2.2Meg	2		BTB-2.2Meg	Note 3

♦ R82A, R82B, R82C, C78A, C78B and C78C are combined in one unit.
Note 1: Some versions may use a 4.7Meg in this application.
Note 2: Not used in some versions.

TRANSFORMER (FILAMENT)

ITEM No.	RATING PRI.	RATING SEC 1	RATING SEC 2	ARVIN PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	RCA TYPE No.	Halldorson PART No.	Thordarson PART No.
T1	117VAC	⑤ 6.3VAC ⑤ 1.53A ⑤ 12A		41844						

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No	USE	ARVIN PART No.	Halldorson PART No.	Merit PART No.	RCA PART No.	Ram PART No.	Stancor TYPE No.	Thordarson PART No.	Triad PART No.
T2	Vert. Osc. Trans.	41745-1	B6702	A-3002	209T1 ①	V405	A-8126	34A87 ①	A-97X
T3	Horiz. Output Trans.	41852				V302 ①			
T4	Vert. Output Trans.	41844-1	Z1802	A-3038			A-8144	26B53	A-106X
T5A	Yoke (90°)-Horiz. (12MC)	43504 ③					DY-13A ③	Y-14 ③ ④	
B	Yoke (90°)-Vert. (40MC)								
T6	Horiz. Lin. & Width (1.2-2.5MH)	41887 ⑤	RF800 ⑦	MWC-6 ⑦	212R1 ⑥	20LR15 ⑥	WC-8 ⑤	WC-18 ⑦	WC-13 ⑦ ⑥
T7	Horiz. Coil (2.5-18MH)	41884 ⑤	RF800 ⑦ ⑪	MWC-6 ⑦	212R1 ⑥	20LR16 ⑥	WC-8 ⑤	WC-18 ⑦	WC-13 ⑦ ⑥ ⑪

① Drill new mounting holes.
② Includes capacitor C105; Resistors R91 and R92.
③ Connect as in original circuit.
④ Use original horiz. yoke damping network if necessary.
⑤ Does not include core; part no: 43157.
⑥ Drill new mounting hole.
⑦ Use original slider and core.
⑧ Connect to coded blue and green terms.
⑨ Connect to terms #3 and #4.
⑩ Connect to coded red and blue terms.
⑪ Connect to terms #1 and #2.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	ARVIN PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	NOTES
T8	6.2KΩ	3.3Ω	42144-1	A-3878	A-3931	S-7X	21113	22B46	

SPEAKER

ITEM No.	RATINGS SIZE	RATINGS FIELD	RATINGS V. C. IMP.	ARVIN PART No	VIKING PART No.	QUAM PART No	NOTES
SP1	6"	PM	3.2Ω	42529	678	6A1	Used in Models 21-551 & 21-553
	8"	PM	3.2Ω	42532	679	8A21	Used in Model 21-550
	10"	PM	3.2Ω	42534	1071	10A21	Used in Model 21-552
SP2	4"	PM	3.2Ω	42531	676	4A07	Used in Model 21-553
	8"	PM	3.2Ω	41878	526	5A1	Used in Model 21-553

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	ARVIN PART No.	MAYFISHER PART No.	MERIT PART No.	MILLER PART No	NOTES
L1	UHF Ant. Primary Coil	0Ω						
L2	UHF Ant. Secondary Coil	0Ω						
L3	UHF RF Coil	0Ω						
L4	UHF Osc. Coupling Coil	0Ω						
L5	UHF Osc. Coil	0Ω						
L6	UHF Osc. Coil	0Ω						
L7	UHF Mixer Coil	0Ω						
L8	UHF Fil. Choke	0Ω						
L9	UHF Fil. Choke	0Ω						
L10	UHF Cathode Choke	0Ω						
L11	UHF RF Choke	0Ω						
L12	UHF RF Coil	L 4Ω						
L13	UHF IF Output Coil	0Ω						
L14	UHF IF Coil	.1Ω						
L15	VHF Ant. Trans.	0Ω	0Ω					Channel 13 position
L16	VHF Ant. Coil	0Ω						
L17	VHF Ant. Coils	0Ω						
L18	VHF Fil. Choke	0Ω						
L19	VHF Fil. Choke	0Ω						
L20	VHF Mod. Coil	0Ω						
L21	VHF RF Coil	0Ω						Channel 13 position
L22	VHF RF Coils	0Ω						
L23	VHF Mixer Grid Coil	0Ω						Channel 13 position
L24	VHF Mixer Grid Coils	0Ω						
L25	VHF Fil. Choke	0Ω						Channel 13 position
L26	VHF Osc. Coil	0Ω						Channel 6 position
L27	VHF Osc. Coil	0Ω						
L28	VHF Osc. Coils	0Ω						
L29	VHF Conv. Plate	.1Ω						
L30	38.75MC Trap	0Ω		41848	17-4501*			
L31	47.25MC Trap	0Ω		41849	17-4502*			
L32	1st Video IF	0Ω		43027			6317	Includes 41.25MC trap
L33	2nd Video IF	.1Ω		43135	17-4523		6319	
L34	3rd Video IF	.1Ω	.1Ω	43135	17-4523		6319	
L35	Series Peaking Coil	4.3Ω		25468-25	19-7300●	TV-181●	4643●	100 Microhenries; Wound on 5.3KΩ resistor
L36	Shunt Peaking Coil	4.4Ω		25468-33	19-3125		6153	130 Microhenries
L37	4.5MC Trap	1.5Ω	1.5Ω	41879				
L38	Series Peaking Coil	8Ω		25468-29	19-3180▲	TV-184▲	6180▲	185 Microhenries; Wound on 12KΩ resistor
L40	Shunt Peaking Coil	11Ω		25468-30	19-3500■	TV-188■	6174■	300 Microhenries; Wound on 8.2KΩ resistor
L41	Series Peaking Coil	4.8Ω		25468-31	19-3125+		6153+	130 Microhenries; Wound on 5.6KΩ resistor
L42	Shunt Peaking Coil	8Ω		25468-24	19-3180	TV-184	6184	300 Microhenries
L43	Sound IF	4.8Ω	2.8Ω	41177	16-3445	TV-108▲	62031	130 Microhenries
L44	Cathode Choke	4.8Ω		25468-23	19-3125		6153	
L45	Quadrature Coil	4.8Ω		40927	17-1031#	TV-106†	1466¶	
L46	Horiz. Osc.	80Ω		23449	19-1578		6310	
L47	RF Choke	4.2Ω		25468-10	19-3095	TV-181	6177	83 Microhenries

* Use trap winding only.
■ Parallel with 8.2KΩ resistor.
▲ Parallel with 12KΩ resistor.
+ Parallel with 5.6KΩ resistor.
– Drill two new mounting holes.
† Use adaptor plate.
# Drill one new mounting hole.
¶ Drill one new mounting hole and use one winding only.

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	RATINGS D. C. RESISTANCE	RATINGS INDUCTANCE @ CURRENT 1000 ~/sec	ARVIN PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.
L48	.340A	47.8Ω	2.16 Hy.	32561-6			C3037		

ARVIN MODELS 21-550K, K&U, K&M, K&U&M, 21-551K, K&U, K&M, K&U&M, 21-552K, K&U, K&M, K&U&M, 21-553K, K&U, K&M, K&U&M (CH. 12379, 12382)

PARTS LIST AND DESCRIPTIONS (Continued)

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA						NOTES
	CURRENT	ARVIN PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	SARKES TARZIAN PART No.	SELETRON PART No.	
M1	.350A	42383	1237A	D4517		500		
M2	.350A	42383	1237A	D4517		500		

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			ARVIN PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M3	3AG S/B	1/4A 125V	42158	42156	313.250 (1/4A-3AG-S/B)	357001	MDL 1/4	4405

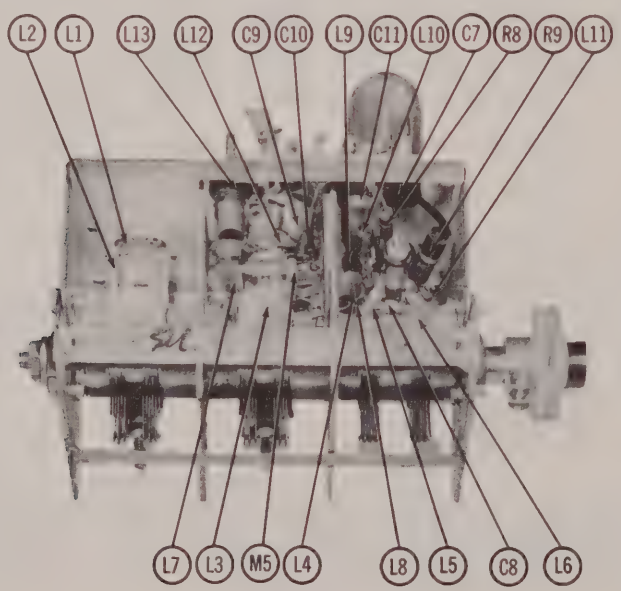
CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		ARVIN PART No.	FEDERAL PART No.	SYLVANIA PART No.	
M4	1N64	23261	1N60 or 1N64A	1N60 or 1N132	Video Det.
M5	1N82*		1N82	1N82 or 1N82A	UHF Crystal Mixer

* Some versions may use a 1N82A or K3 crystal diode in this application.

MISCELLANEOUS

ITEM No.	PART NAME	ARVIN PART No.	NOTES
M6	Dial Light		#47 - Bayonet
M7	Tuner	42167	VHF
M8	Tuner	41738	UHF
M9	Video Det. Assy.	42087	Includes resistors, capacitors, coils and M4
M10	Focus Magnet	42550-1	Includes centering device.
M11	Ion Trap	42523-1	
B1, B3	Trimmer cap.		2 Section - Horiz. Drive & Horiz. Freq. (110-480MMF. each)
	Knob	42409-1	Channel Selector - VHF-Mahogany
	Knob	42389-1	Channel Selector - UHF-Mahogany
	Knob	42409-2	Channel Selector - VHF-Blonde
	Knob	42389-2	Channel Selector - UHF-Blonde
	Knob	42392	Fine Tuning
	Knob	42390-1	On-Off-Volume--Mahogany
	Knob	42390-2	On-Off-Volume--Blonde
	Knob	42391	Brightness
	Knob	42507-1	Vertical Hold & Contrast-Mahogany
	Knob	42507-2	Vertical Hold & Contrast-Blonde
	Tab	40216	UHF
	Disc	42393	Indicator-UHF
	Safety Glass	42543	Tinted, Tempered
	Safety Glass	42343	Tempered
	Mask	42214-2	Gold, Plastic
	Mask	42214-1	Green, Plastic



UHF TUNER

PROPERTY OF
L. F. SLANTONSHIP
DENVER, COLORADO

TROUBLE SHOOTING AIDS (cont)

HIGH VOLTAGE

LOSS OF HIGH VOLTAGE

Check by substitution V17, V18, V19 and V20. Check waveform W17.

If Satisfactory	If Unsatisfactory
Check T3, T5A, T6, T7, C99, C100, C101, R106, R107, R108 and other associated components.	Check L48, C97, C96, R100, R102, R99 and other associated components.

INSUFFICIENT HIGH VOLTAGE

Check by substitution V18 and V19. Check M1 and M2. Check R106, R107, R108, C104 and other associated components. Check T3 and T5A.

BLOOMING

Check by substitution V18, V19 and V20. Check M1 and M2. Check R102, R103, C98 and other associated components.

GENERAL

RASTER, SOUND, NO PICTURE

Follow procedure outlined under "Loss of Video".

RASTER, PICTURE, NO SOUND

Follow procedure outlined under "Weak or No Sound".

RASTER, NO SOUND, NO PICTURE (VHF)

Check by substitution V2, V3, V4, V5, V6, V7, V8 and V9. Check video IF components for failure or change of value.

RASTER, NO SOUND, NO PICTURE (UHF)

Substitute V1.

NO RASTER, NO SOUND

Follow procedure outlined under "Dead Set".

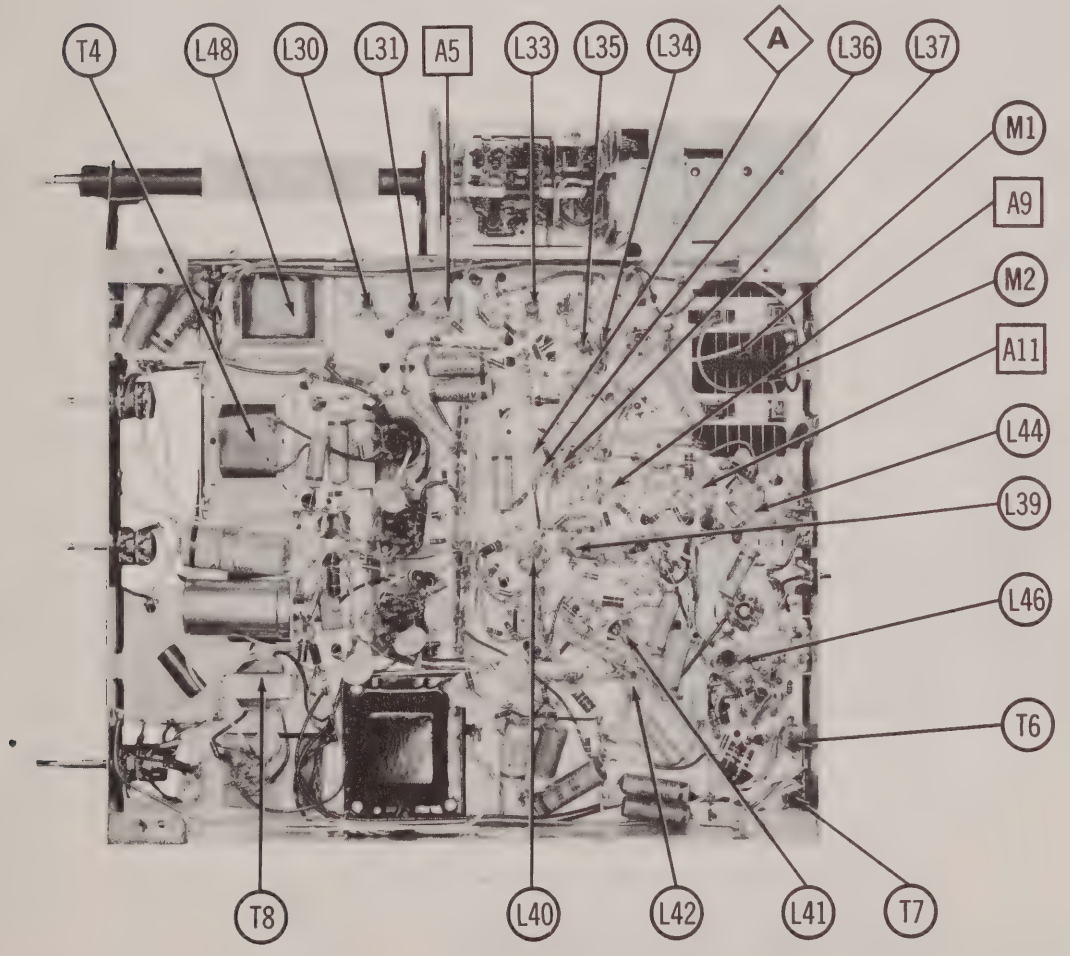
KEYSTONE EFFECT

Check T5 and its associated components.

INTERMITTENT STREAKS

Check high voltage section for corona discharge and arcing.

Symptoms shown are assumed and are not indicative of the quality and workmanship of this equipment.



CHASSIS BOTTOM VIEW-TRANS., INDUCTOR & ALIGN. IDENTIFICATION

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the VHF tuner oscillator circuit may be accomplished by removing the channel selector and fine tuning knobs.

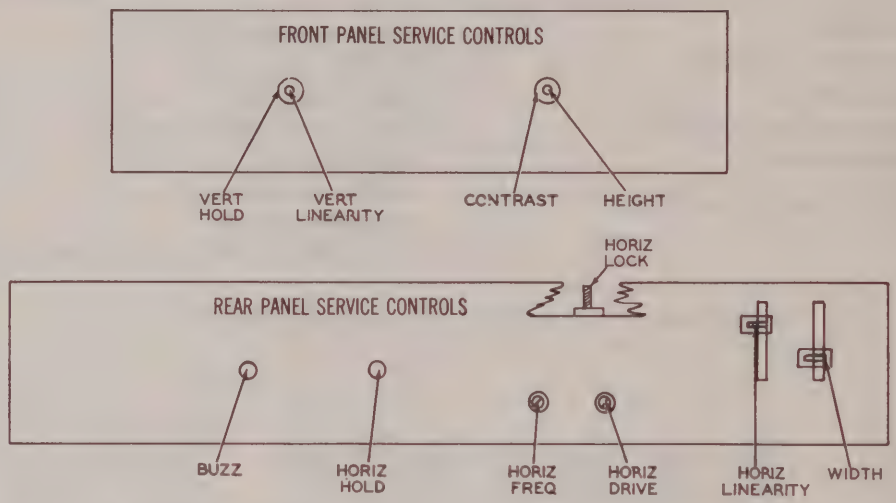
PICTURE TUBE SAFETY GLASS CLEANING

To clean safety glass remove 5 wood screws holding metal strip at the top of safety glass. Remove metal strip and safety glass. Use extreme caution when removing safety glass.

PICTURE TUBE REMOVAL

For picture tube removal it is necessary to remove chassis. (See disassembly instructions).

SERVICE ADJUSTMENT LOCATION



HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

For adjustment of the horizontal oscillator, it is necessary to remove the rear cover and supply power to set. Adjustment is located on top of chassis. Set the horizontal hold control at the center of its range and adjust the horizontal lock slug (L46) until picture synchronizes horizontally. (For location see tube placement chart).

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate sound IF detector buzz, adjust the buzz control located on rear apron of chassis for maximum volume and minimum buzz. If results are unsatisfactory, see alignment instructions of Page 6 & 7.

FUSES

One fuse is used for horizontal sweep circuit protection. (For location see tube placement chart).

CENTERING

Centering is accomplished mechanically by means of a centering lever on the PM focusing assembly. Adjust the centering lever from side to side, and up and down until the picture is properly centered.

BUILT-IN ANTENNA TUNING

Built-in antenna can be adjusted from rear of the cabinet. Adjust for a picture of maximum contrast and minimum ghosts.

DISASSEMBLY INSTRUCTIONS

1. Remove 7 push-on type control knobs from front panel.
2. Remove 9 metal screws from rear cover. Disconnect antenna leads. Remove rear cover.
3. Remove 1 metal screw from speaker plug.
4. Disconnect speaker plug from chassis. Disconnect picture tube socket, HV lead and deflection yoke socket.
5. Remove 1 metal screw from deflection yoke lead shielding.
6. Remove 4 chassis bolts. Remove chassis.
7. Remove 4 speaker nuts from each speaker. Remove speaker.
8. Remove 4 nuts and 4 metal screws from front tube mounting brackets.
9. Remove picture tube, deflection yoke and focus assembly.
10. Remove 2 screws from front tube mounting band.
11. Remove picture tube from deflection yoke and focus assembly.

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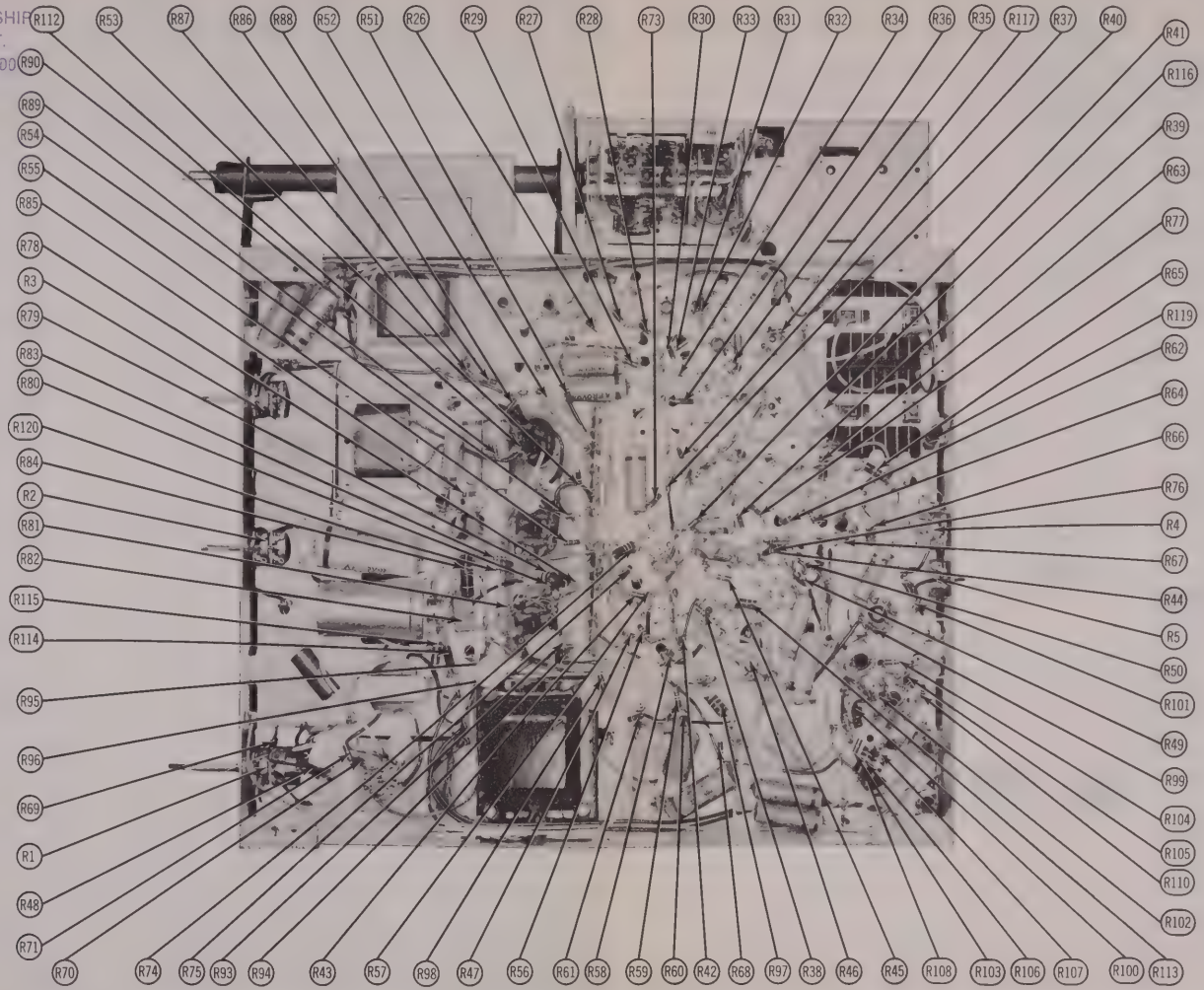
DENVER, COLORADO

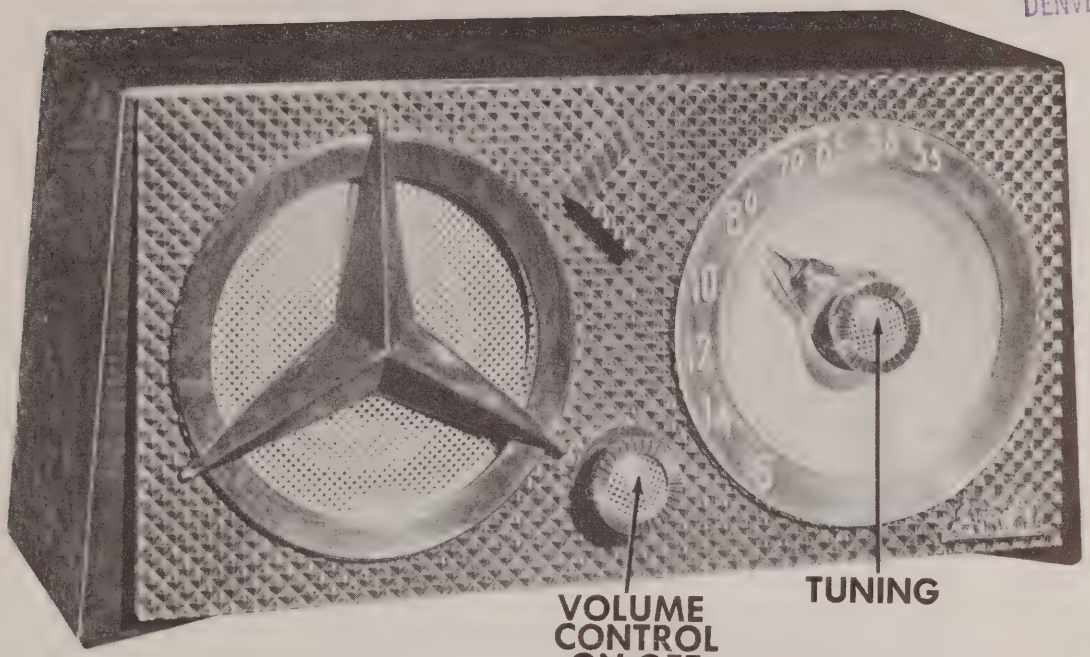


CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

ARVIN
MODELS 851T, 855T (Ch. RE377)

L. F.
3924
DENVER, COLORADO

ARVIN
MODELS 851T, 855T (Ch. RE377)



ARVIN
MODELS 851T, 855T (Ch. RE377)

TRADE NAME	Arvin 851T, 855T (Ch. RE-377)
MANUFACTURER	Arvin Industries, Columbus, Ind.
TYPE SET	AC-DC Operated AM Superheterodyne Receiver
TUBES (Five)	Types 12BE6 Conv., 12BA6 IF Amp., 12AV6 Det-AVC-AF Amp., 50C5 Output, 35W4 Rectifier
POWER SUPPLY	105-125 Volts AC-DC — RATING .25 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	540KC - 1600KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1	.1MFD	High side to pin 7 (grid) of 12BE6 (V1). Low side to chassis.	455KC (400∿ Mod.)	Tuning gang fully open.	Across voice coil.	A1, A2 A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2	"	"	1600KC	"	"	A5	"
3		Loop	1400KC	Tune to 1400KC signal.	"	A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		ARVIN PART No.	STANDARD REPLACEMENT		
V1	Converter	12BE6	12BE6	7CH	
V2	IF Amp.	12BA6	12BA6	7BK	
V3	Det-AVC-AF Amp.	12AV6	12AV6	7BT	
V4	Output	50C5	50C5	7CV	
V5	Rectifier	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	ARVIN PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	■50	150		AFH3-70		C056			TVL-3424	
B	▲30	150								
C	20	25								
C2	.05	200		P288-05	DF-503	CUB2S5		PT415	2TM-S5	
C3	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C4	100	500		1468-101	D6-101	5W5T1	GP1K-101	MC235	1FM-31	
C5	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C6A	5000			♦PA-112-1	♦PC-70	♦112TM1	♦1406-01		♦T-3	
B	250									
C										
C7	.02	200		P288-02	DF-203	CUB2S2	821-02	PT412	2TM-S2	
C8	20000			BPD-02	DF-203	K085	821-02	PT412	5HK-S2	
C9	.05	400		P488-05	DF-503	CUB4S5		PT415	4TM-S5	

♦ Items C6A, C6B, C6C, R7A, R7B are combined in one unit.
When replacing items seperately, C6B and C6C should total 250MMF.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	ARVIN PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1	500KΩ	½	C42134					Volume & Switch

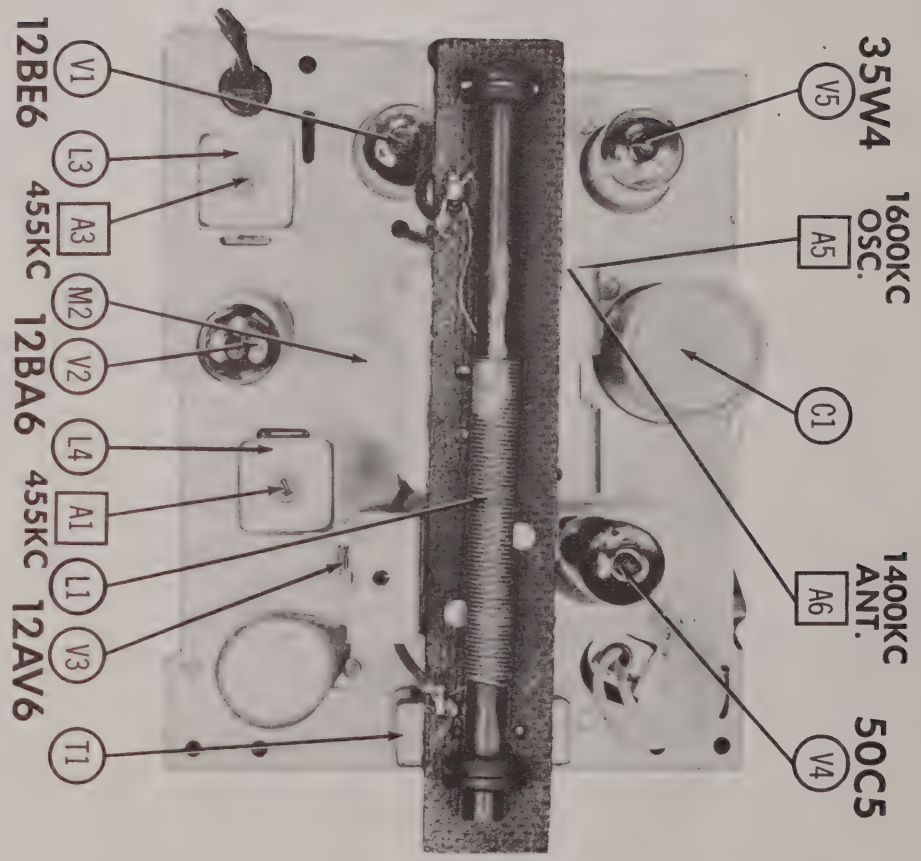
RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	ARVIN PART No.	IRC PART No.	
R2	22KΩ	½		BTS-22K	
R3	68KΩ	½		BTS-68K	
R4	68Ω	½		BTS-68	
R5	2.2Meg	½		BTS-2.2Meg	
R6	10Meg	½		BTS-10Meg	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	ARVIN PART No.	IRC PART No.	
R7A	500KΩ	½	♦	BTS-500K	
B	500KΩ	½		BTS-500K	
R8	120Ω	½		BTS-120	
R9	1200Ω	1		BTA-1200	
R10	150Ω	½		BTS-150	
R11	330KΩ	½		BTS-330K	

♦ Items R7A, R7B, C6A, C6B and C6C are combined in one unit.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	ARVIN PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	
T1	2.3KΩ	3.3Ω		A-3332	A-3025	S-12X	Z1101	24S50 ①	① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	ARVIN PART No.	JENSEN PART No.	QUAM PART No.	
SP1	4"	PM	3.3Ω	C22875	ST-113 Mod. P4-X	4A07	

COILS (RF-IF)

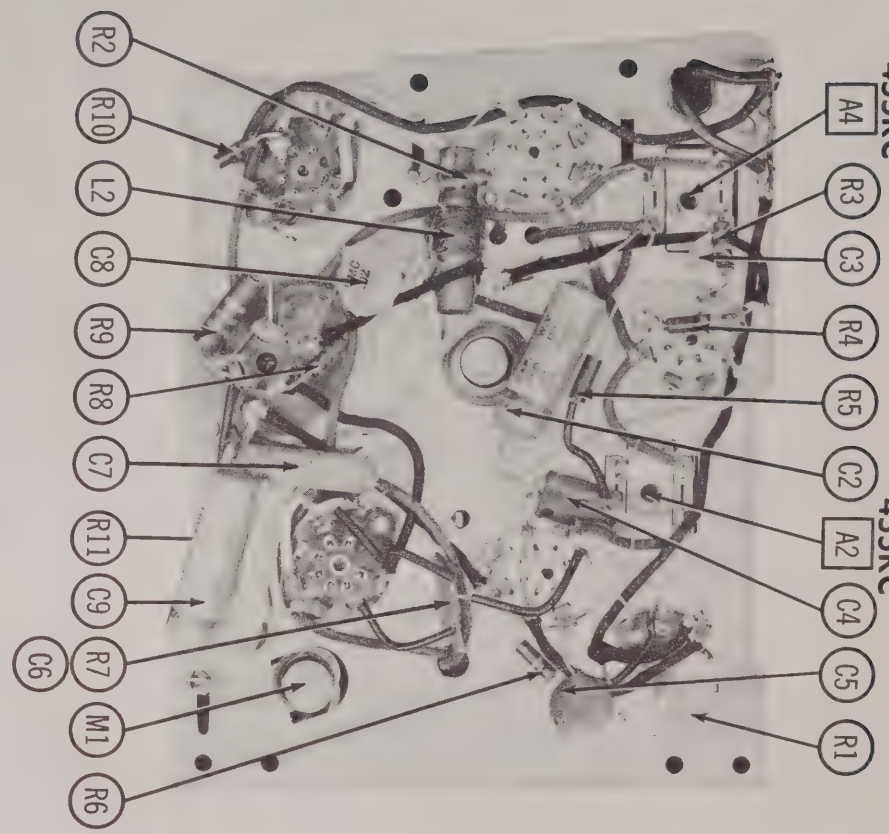
ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	ARVIN PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Ant. Coil	.3Ω						
L2	Osc. Coil	1.1Ω	7.5Ω		14-1073		69-Osc.*	Tertiary winding.
L3	Input IF	13Ω	13Ω		16-6758	BC-352	12-C1	
L4	Input IF	13Ω	13Ω		16-6758	BC-353	12-C2	

* Drill mounting hole.

MISCELLANEOUS

ITEM No.	PART NAME	ARVIN PART No.	NOTES
M1	Dial Light		Bayonet, #47
M2	Tuning Cap.	C42107	21-310MMF; 21-165MMF.

CHASSIS—BOTTOM VIEW



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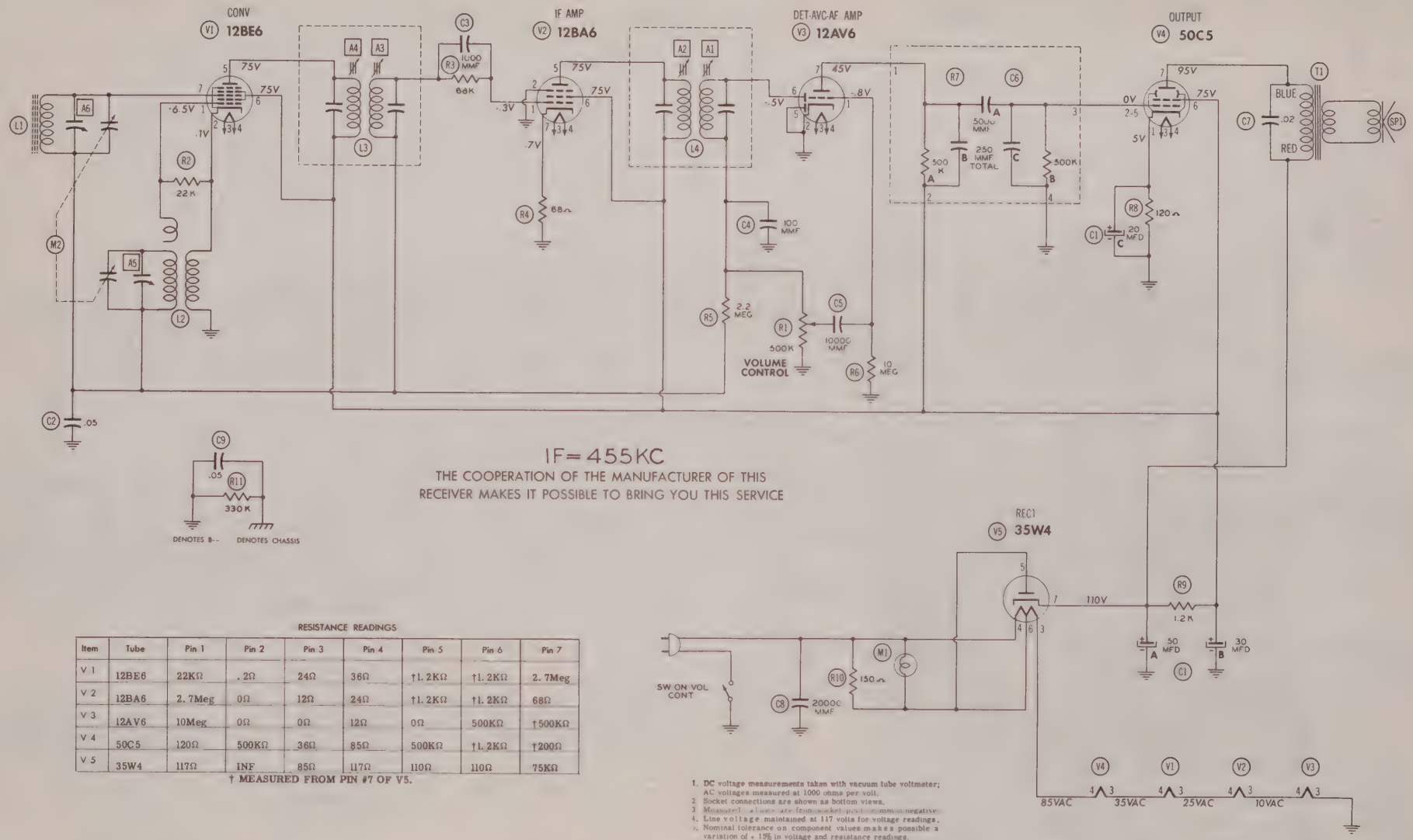
ARVIN
MODEL 851T (Ch. RE-377)



IF=455KC

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12BE6	22KΩ	.2Ω	24Ω	36Ω	†1.2KΩ	†1.2KΩ	2.7Meg
V 2	12BA6	2.7Meg	0Ω	12Ω	24Ω	†1.2KΩ	†1.2KΩ	68Ω
V 3	12AV6	10Meg	0Ω	0Ω	12Ω	0Ω	500KΩ	†500KΩ
V 4	50C5	120Ω	500KΩ	36Ω	85Ω	500KΩ	†1.2KΩ	†200Ω
V 5	35W4	117Ω	INF	85Ω	117Ω	110Ω	110Ω	75KΩ

† MEASURED FROM PIN #7 OF V5.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pins to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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CAVALIER
MODEL 4P3

CAVALIER
MODEL 4P3

TRADE NAME	Cavalier Model 4P3
MANUFACTURER	Hinners-Galanek Radio Corp., 2514 Broadway, Long Island City, 6, N.Y.
TYPE SET	Three Power Portable AM Superheterodyne Receiver
TUBES (Four)	Types 1R5 Conv., 1U4 IF Amp., 1U5 Det.-AVC-AF Amp., 3V4 Output
POWER SUPPLY RATING	110-120 Volts AC-DC (or) 7½ Volts "A" Supply & 90 Volts "B" Supply in Pack Form .15 Amp. @ 117 Volts AC (or) 50MA @ 7½ Volts DC & 14MA @ 90 Volts DC
TUNING RANGE—BROADCAST	535KC-1630KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
With tuning gang fully closed set last reference mark at low frequency end of dial to coincide with index mark on cabinet.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 6 (grid) of 1R5 (V1). Low side to B-	455KC (400∿Mod)	Tune to 1000KC on dial	Across voice coil	A1, A2, A3, A4	Adjust for maximum output. If AC power is used without an isolation transformer, reduce dummy antenna to 200MMF to reduce hum modulation.
2.	"	"	1630KC	Tuning gang fully open	"	A5	"
3.		Loop	1400KC	Tune to 1400KC signal.			Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

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PARTS LIST AND DESCRIPTIONS

CAVALIER MODEL 4P3

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA: CAVALIER PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RETMA BASE TYPE	NOTES
V1	Converter	1R5	1R5	7AT	
V2	IF Amplifier	1U4	1U4	6AR	
V3	Det.-AVC-AF Amp.	1U5	1U5	6BW	
V4	Output	3V4	3V4	6BX	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: CAVALIER PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	▪40	150	150-114	AFH4-33					TVL-4420	
B	■40	150		PRS25/25					TVA-1131	
C	200	10								
D	▲50	25								
C2	300			SI300	D6-301	TP42	GP2K-301	UC-533	5GA-T3	Note 1
C3	.05	200	152-104	P288-05	DF-503	CUB2S5		PT415	2TM-S5	
C4	.25	100	152-113	P288-25		CUB2P25		PT4025	2TM-P25	
C5	20000		152-102	BPD-02	DF-203	K085	821-02	PT412	5HK-S2	
C6	.02	400	152-102	P488-02	DF-203	CUB4S2	821-02	PT412	4TM-S2	
C7A	100		†	†PA-97-1	†PC-50	†111TM1	†1403-01	UC-531	†D-1	
B	100							UC-531		
C8	2000			BPD-002	DD-202	K072	801-002	DC-522	5HK-D2	Note 2
C9A	50							UC-545		
B	5000		♦	♦PA-116-1	♦PC-90	♦114TM1	♦1407-01	DC-525	♦P-2	
C	2000							DC-522		
C10	5000		152-110	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C11	.05	400	152-109	P488-05	DF-503	CUB4S5		PT415	4TM-S5	
C12	.1	400	150-114	P488-1	DF-104	CUB4P1		PT401	4TM-P1	

Note 1. Some versions use 220MMF in this application (part no. 156-101).
Note 2. Some versions use 5000MMF in this application (part no. 152-114).
† Items C7A, C7B, R9 are combined in one unit.
♦ Items C9A, C9B, C9C, R13A, R13B, R13C are combined in one unit.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: CAVALIER PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1Meg	½	120-111	Q13-137	A47-1Meg-Z	BSK-70-S	U-53	Volume
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	76-2	SWE-20	Not Req.	US-27	Attach to R1A

RESISTORS

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: CAVALIER PART No.	IRC PART No.	NOTES
R2	3.3Meg	½	180-137	BTS-3.3Meg	
R3	100KΩ	½	180-116	BTS-100K	
R4	22KΩ	½	180-143	BTS-22K	
R5	3.3Meg	½	180-137	BTS-3.3Meg	
R6	6.8Meg	½	180-135	BTS-6.8Meg	
R7	560KΩ	½	180-128	BTS-560K	
R8	680Ω	½	180-140	BTS-680	
R9	47KΩ	½	†	BTS-47K	
R10	3.3Meg	½	180-137	BTS-3.3Meg	

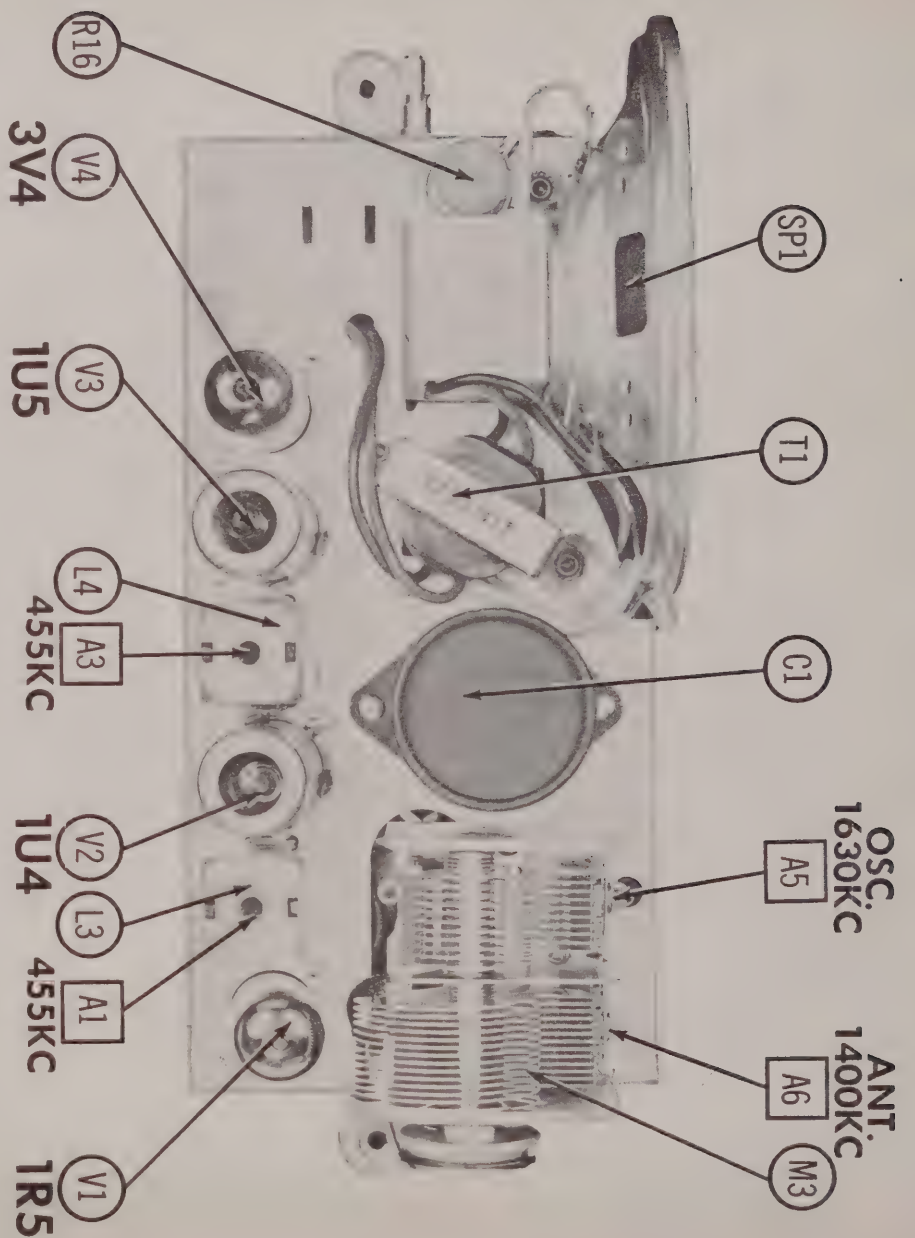
ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: CAVALIER PART No.	IRC PART No.	NOTES
R11	680Ω	½	180-140	BTS-680Ω	
R12	10Meg	½	180-123	BTS-10Meg	
R13A	4.7Meg	½		BTS-4.7Meg	
B	1Meg	½	♦	BTS-1Meg	
C	2.2Meg	½		BTS-2.2Meg	
R14	1000Ω	½	180-142	BTS-1000	
R15	30Ω	2	180-141		
R16	2700Ω	10	20-145		
R17	2700Ω	1		BTA-2700	
R18	220KΩ	½	180-105	BTS-220K	

† Items R9, C7A and C7B are combined in one unit.
♦ Items R13A, R13B, R13C, C9A, C9B, and C9C are combined in one unit.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE: PRI.	IMPEDANCE: SEC.	REPLACEMENT DATA: CAVALIER PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	NOTES
T1	9.8KΩ	3.3Ω	175-111T	A-3329	A-2927 ①	S-11X	Z1117 ①	24S49	① Drill one new mounting hole.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	CAVALIER PART No.	JENSEN PART No.	QUAM PART No.	
SP1	5"	PM	3.3Ω	175-111	ST-105 Mod. P5-X	5A1	

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	CAVALIER PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Loop Ant.	3.2Ω		134-106				Includes cabinet back
L2	Osc. Coil	1.8Ω	5.7Ω	136-114	14-1073 *		69-Osc.■	Tertiary winding
L3	Input IF	20Ω	20Ω	130-111	16-6758	BC-352	12-C1	
L4	Output IF	20Ω	20Ω	130-111	16-6758	BC-353	12-C2	

* Leads sufficient mounting support.
■ Drill mounting hole.

SELENIUM RECTIFIER

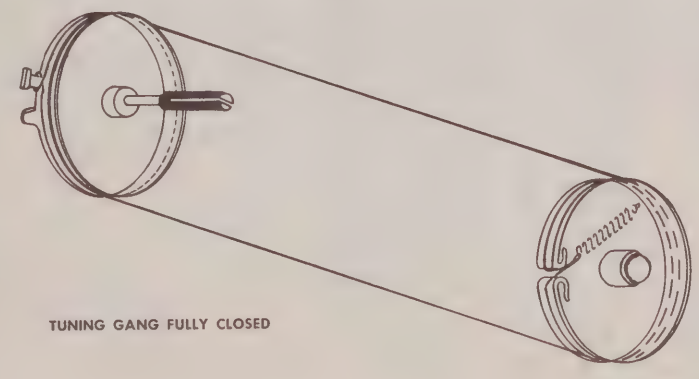
ITEM No.	RATING	REPLACEMENT DATA						NOTES
	CURRENT	CAVALIER PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	SARKES TARZIAN PART No.	SELETRON PART No.	
M1	.067ADC	265-101	1003A	RS75	6S75	75	5M4	

BATTERIES

ITEM No.	VOLTAGE	CAVALIER PART No.	REPLACEMENT DATA						INSTALLATION NOTES
			EVEREADY			BURGESS			
			"A"	"B"	"A-B"	"A"	"B"	"A-B"	
M2	7.5V "A" 90V "B"				756			T6Z60	

MISCELLANEOUS

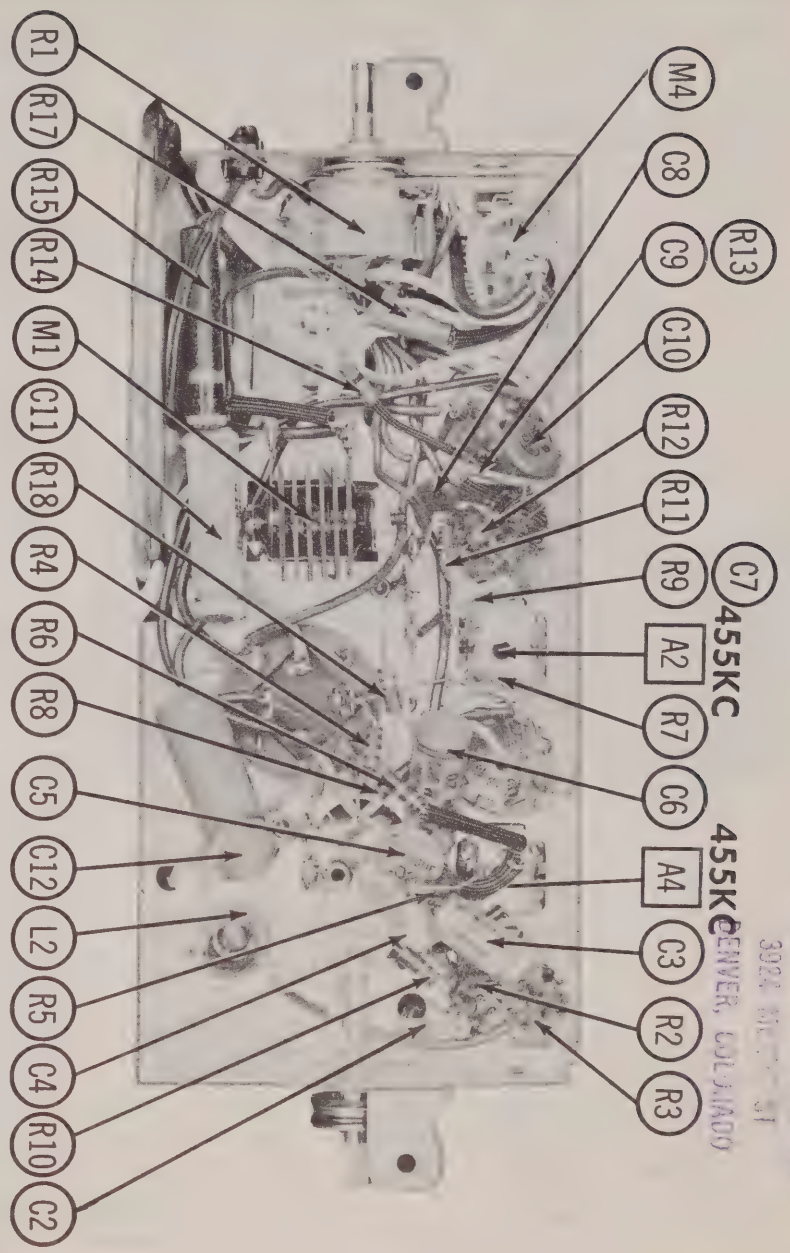
ITEM No.	PART NAME	CAVALIER PART No.	NOTES
M3	Tuning Cap.	160-108	26-430MMF, 22-150MMF
M4	Switch	125-107	Change-over
	Cabinet	210-110	
	Handle	240-111	
	Knob	220-118	Tuning
	Knob	220-117	On-off-volume



TUNING GANG FULLY CLOSED

DIAL CORD STRINGING

CHASSIS—BOTTOM VIEW



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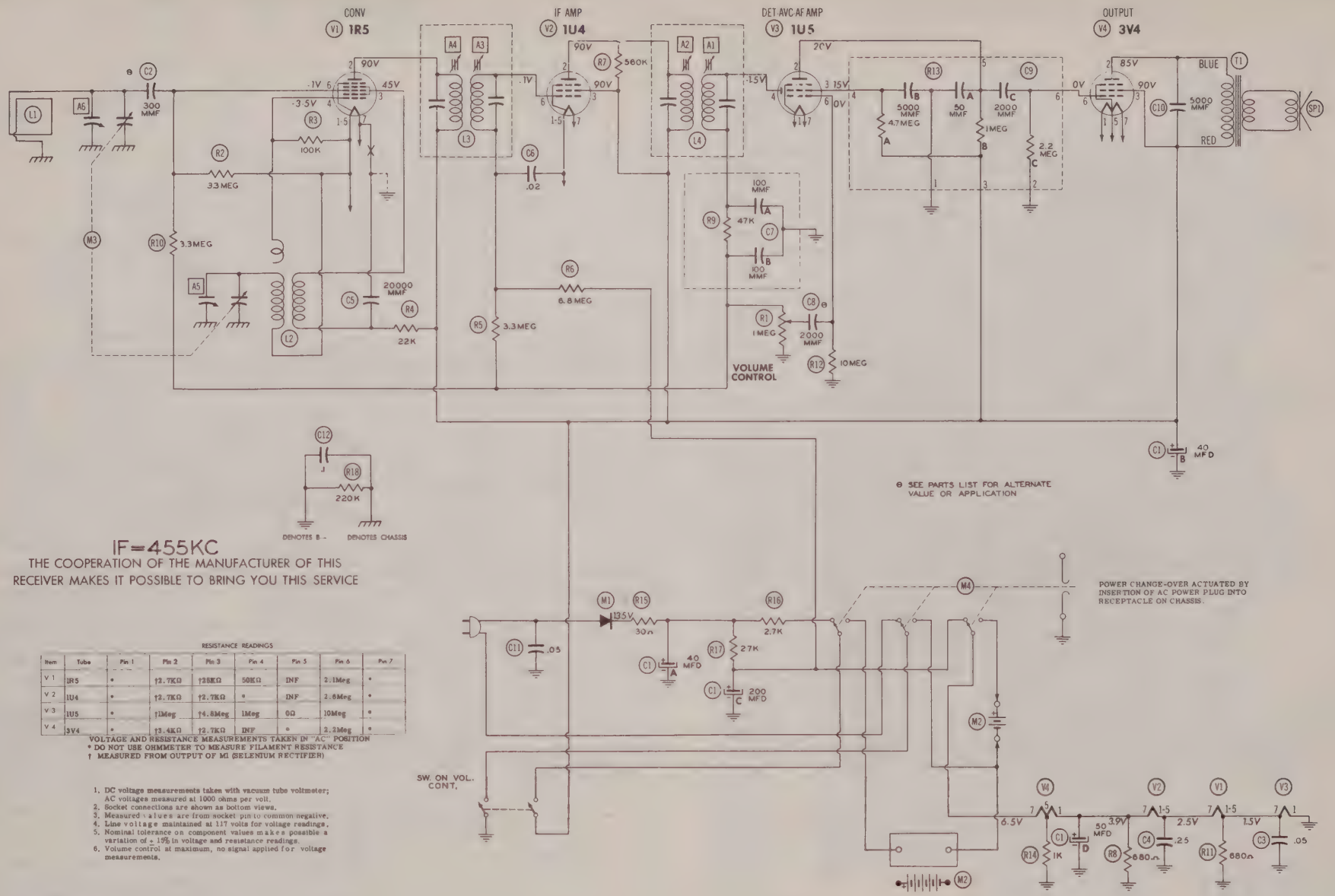
3924 [illegible]
DENVER, COLORADO

SET 266 FOLDER 4

CAVALIER MODEL 4P3

CAVALIER MODEL 4P3



θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

IF=455KC

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	1R5	*	†2.7KΩ	†25KΩ	50KΩ	INF	2.1Meg	*
V 2	1U4	*	†2.7KΩ	†2.7KΩ	*	INF	2.6Meg	*
V 3	1U5	*	†1Meg	†4.8Meg	1Meg	0Ω	10Meg	*
V 4	3V4	*	†3.4KΩ	†2.7KΩ	INF	*	2.2Meg	*

VOLTAGE AND RESISTANCE MEASUREMENTS TAKEN IN "AC" POSITION
* DO NOT USE OHMMETER TO MEASURE FILAMENT RESISTANCE
† MEASURED FROM OUTPUT OF M1 (SELENIUM RECTIFIER)

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

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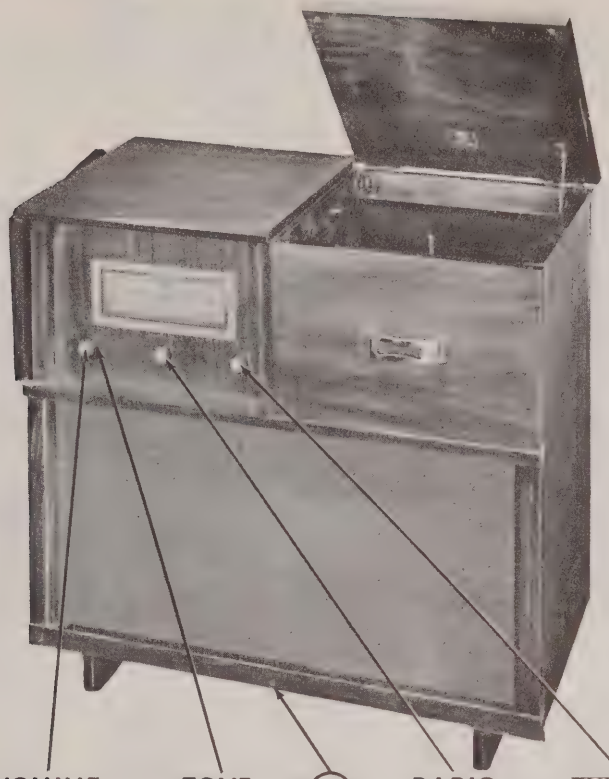
EMERSON
MODEL 809A (Ch. 120221-A)



EMERSON
MODEL 809A (Ch. 120221-A)

TRADE NAME	Emerson Model 809A (Ch. 120221-A)
MANUFACTURER	Emerson Radio & Phono Corp., 111 Eighth Ave., New York, N. Y.
TYPE SET	AC Operated Radio-Phono Combination AM Superheterodyne Receiver
TUBES (Seven)	Types 6BJ6 Osc., 6BJ6 Mixer, 6BJ6 1st IF Amp., 6BJ6 2nd IF Amp., 12AT6 Det-AVC-AF Amp., 50C5 Audio Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC - 60 Cycles — RATING .38 Amp. @ 117 Volts AC
TUNING RANGE	BROADCAST 540KC - 1630KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1	.005MFD	High side to pin 1 (grid) of 6BJ6 (V1). Low side to B-.	455KC (400~ Mod.)	Tuning gang fully open.	Across voice coil.	A1, A2 A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2		Loop	1630KC	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3		"	1400KC	Tune to 1400KC signal.	"	A6	"

FOR SERVICE INFORMATION ON RECORD CHANGER UNIT PART NO. 819074 SEE SIMILAR V-M MODEL 950 PHOTOFACT SET #216--FOLDER 11 OR RECORD CHANGER MANUAL CM-5.

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed."
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PARTS LIST AND DESCRIPTIONS

EMERSON MODEL 809A (Ch. 120221-A)

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA: EMERSON PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RETMA BASE TYPE	NOTES
V1	Osc.	6BJ6	6BJ6	7CM	
V2	Mixer	6BJ6	6BJ6	7CM	
V3	1st IF Amp.	6BJ6	6BJ6	7CM	
V4	2nd IF Amp.	6BJ6	6BJ6	7CM	
V5	Det-AVC-AF Amp.	12AT6	12AT6	7BT	
V6	Output	50C5	50C5	7CV	
V7	Rectifier	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: EMERSON PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	50	150	925195	PRS150/80-40		BBRD8415		TCD498	R1138	Red
B	80	150		PRS25/100		BBR100-25		TC2501		Green
C	100	25								Yellow
C2	.05	400	923554	P488-05	DF-503	CUB4S5		PT415	4TM-S5	
C3	2.2									
C4	.02	400	923524	P488-02	DF-203	CUB4S2		PT412	4TM-S2	
C5	.02	400	923524	P488-02	DF-203	CUB4S2		PT412	4TM-S2	
C6	220			SI220	D6-221	TP39	GP2K-221	UC-5322	5GA-T22	Note 1
C7A	220				D6-221	TP39	GP2K-221	UC-5322		
B	2000		•470310	•PA-100-1	DD-202	K072	801-002	DC-522	•34C3	
C	220				D6-221	TP39	GP2K-221	UC-5322		
D	5000				DD-502	K080	801-005	DC-525		
C8	220			SI220	D6-221	TP39	GP2K-221	UC-5322	5GA-T22	Note 1
C9	.05	400	923554	P488-05	DF-503	CUB4S5		PT415	4TM-S5	
C10	.002	600	923723	P688-002	D6-202	CUB6D2	801-002	DC-522	5HK-D2	
C11	.02	400	923524	P488-02	DF-203	CUB4S2		PT412	4TM-S2	
C12	.02	400	923524	P488-02	DF-203	CUB4S2		PT412	4TM-S2	
C13	.05	400	923554	P488-05	DF-503	CUB4S5		PT415	4TM-S5	
C14	.047	400	922101	489ZX-047	DF-503	PJ4S47		PT4147	4TM-S47	
C15	.1	400	923515	P488-1	DF-104	CUB4P1		PT401	4TM-P1	

•Items C7A, C7B, C7C and C7D are combined in one unit.
Note 1: Some versions may use a 212MMF in this application.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: EMERSON PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500KΩ	½	390166	*QJ-133	RTV-295	F1-40	UF55L	Tone - Panel
B	500KΩ	½				R2-44	UR55-T154	Volume tapped at 80KΩ-Rear
C	Switch					KB-2	US-27	Attach to R1B

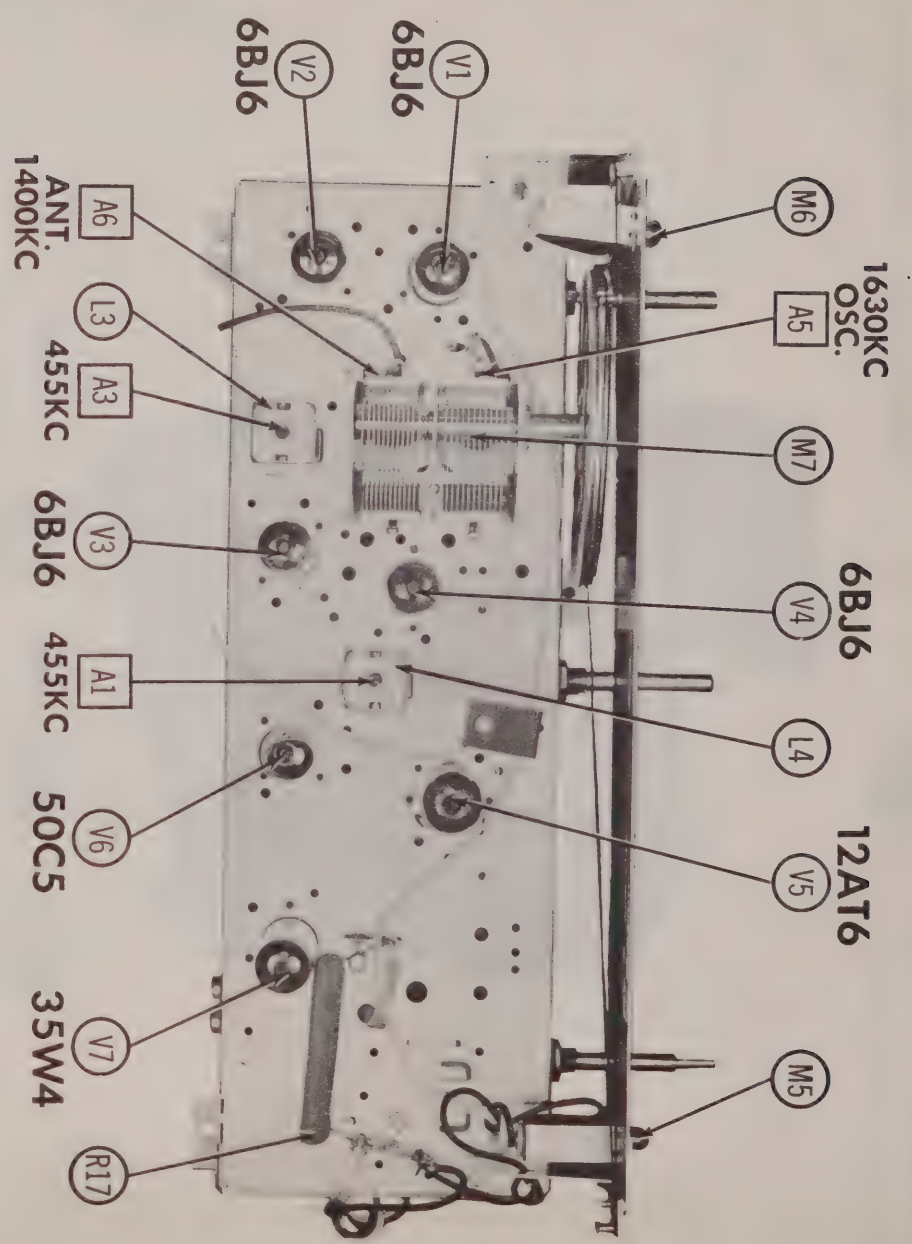
* CONCENTRIKIT EQUIVALENT : KIT K-2, BASE ELEMENTS & SHAFTS : B11-133 & P1-121 (Panel)
B13-133X & R1-207 (Rear)
76-2 SWITCH

RESISTORS

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: EMERSON PART No.	IRC PART No.	NOTES
R2	22KΩ	½		BTS-22K	
R3	1000Ω	½	340492	BTS-1000	
R4	220KΩ	½	341052	BTS-220K	
R5	220Ω	½	340332	BTS-220	
R6	3900Ω	½	340632	BTS-3900	
R7	100KΩ	½	350972	BTS-100K	
R8	120Ω	½	340272	BTS-120	
R9	3.3Meg	½	351332	BTS-3.3Meg	
R10	47KΩ	½	340892	BTS-47K	

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: EMERSON PART No.	IRC PART No.	NOTES
R11	10KΩ	½	340732	BTS-10K	
R12	10Meg	½	351452	BTS-10Meg	
R13	470KΩ	½	351132	BTS-470K	
R14	470KΩ	½	351132	BTS-470K	
R15	150Ω	½	340292	BTS-150	
R16	1000Ω	1	370492	BTA-1000	
R17	680Ω 5%	20	394141		
R18	22Ω	1	370092		

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA: EMERSON PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	NOTES
T1	2.3KΩ	3.6Ω	734063	A-3330 ①	A-3031 ①		Z1102 ①	24S50 ①	① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS SIZE	RATINGS FIELD	RATINGS V. C. IMP.	REPLACEMENT DATA: EMERSON PART No.	JENSEN PART No.	QUAM PART No.	NOTES
SP1	6"	PM	3.6Ω	180122	ST-110 Mod. P6-V	6A21	

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA: EMERSON PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	Loop Ant.	1.5Ω		700054				Includes cabinet back.
L2	Osc. Coil	1.4Ω	9.5Ω	716063	14-1073		69-Osc.*	
L3	Input IF	17Ω	17Ω	720033	16-6758	BC-352	12-C1	
L4	Output IF	17Ω	17Ω	720125	16-6770	BC-355	12-C6	

* Drill mounting hole.

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA: EMERSON PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	SHURE PART No. CARTRIDGE	SHURE PART No. NEEDLE	ELECTRO-VOICE PART No. CARTRIDGE	ELECTRO-VOICE PART No. NEEDLE	REMARKS
M1	960812	ACD-J	A-1 A-3	W22AB	A65MG A62A	46T	0-1 or S-1 and 0-3	

ASTATIC, SHURE AND ELECTRO-VOICE NEEDLE LISTINGS SHOWN ABOVE ARE SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGES LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENTS SEE BELOW.

PHONO NEEDLE

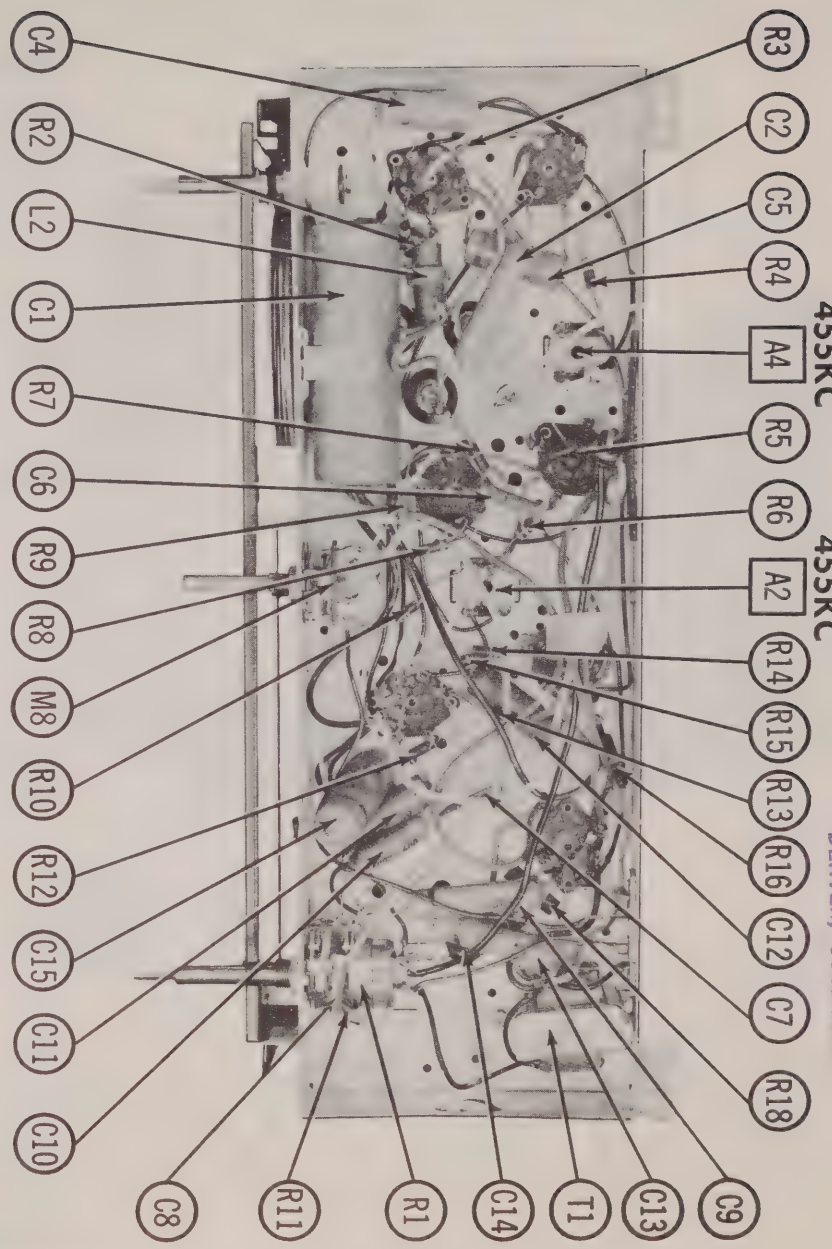
(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA: EMERSON PART No.	JENSEN PART No.	PERMO PART No.	WALCO PART No.	REMARKS
M2	960814 (33 1/3-45 Needle)	*JP-30LP or †JPS-30LP or ♦ JPS-30LPD	*A-322 or †A-300 or ♦A-300D	*W-30MGA or †W-30MGS or ♦ W-30MGD	* Metal † Jewel ♦ Diamond
M3	960813 (78 Needle)	*JP-30 or †JPS-30 or ♦ JPS-30D	*C-320 or †C-318 or ♦C-318D	*W-30A or †W-30S or ♦W-30D	

MISCELLANEOUS

ITEM No.	PART NAME	EMERSON PART No.	NOTES
M4	Jewel Light	807000	#47, Bayonet
M5	Dial Light	807000	#47, Bayonet
M6	Dial Light	807000	#47, Bayonet
M7	Tuning Cap.	900079	18-397MMF; 30-186MMF.
M8	Switch	510077	Radio-Phono
	Cabinet	140602	
	Knob	450068S	Tuning-Phono-Radio
	Knob	450089	Bass-Treble
	Knob	450099S	On-Off-Volume
	Dial Pointer	525056	
	Dial Glass	520193	

CHASSIS—BOTTOM VIEW

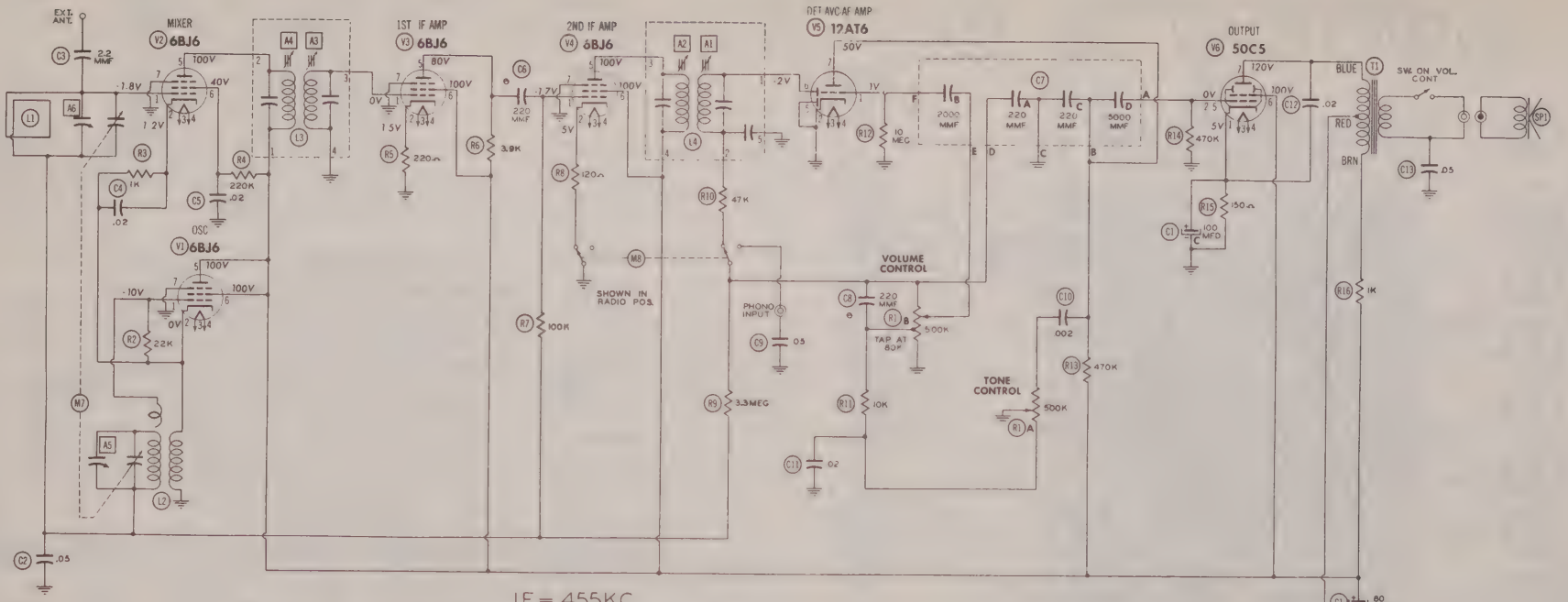


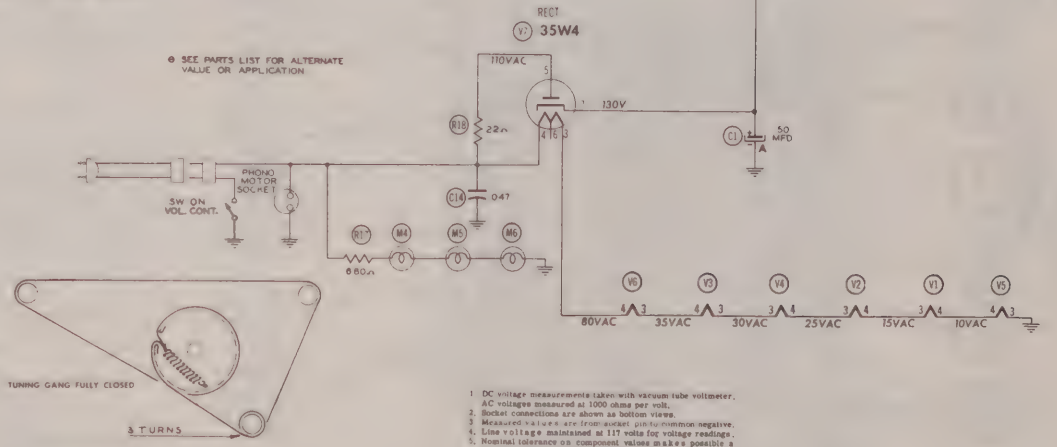
SET 266 FOLDER 5

EMERSON MODEL 809A (Ch. 120221-A)

PROFESSIONAL
L. F. BLANKENBAKER
3924 MILLER
DENVER, COLORADO

EMERSON MODEL 809A (Ch. 120221-A)





RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	6BJ6	3.8Meg	1KΩ	18Ω	12Ω	†1KΩ	†220KΩ	0Ω
V 2	6BJ6	22KΩ	1.2Ω	24Ω	18Ω	†1KΩ	†1KΩ	0Ω
V 3	6BJ6	16Ω	220Ω	30Ω	36Ω	†5KΩ	†1KΩ	0Ω
V 4	6BJ6	3.9Meg	120Ω	30Ω	24Ω	†1KΩ	†1KΩ	0Ω
V 5	12AT6	10Meg	0Ω	0Ω	12Ω	0Ω	550KΩ	†470KΩ
V 6	50C5	150Ω	470KΩ	30Ω	80Ω	470KΩ	†1KΩ	†150Ω
V 7	35W4	100Ω	†1KΩ	80Ω	115Ω	100Ω	130Ω	200KΩ

† MEASURED FROM PIN #7 OF V7.

DIAL CORD STRINGING

1. DC voltage measurements taken with vacuum tube voltmeter. AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from average point to minimum negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements

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FIRESTONE
MODEL 4-A-133

PROPERTY OF
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3924 MEADE ST.
DENVER, COLORADO

FIRESTONE
MODEL 4-A-133

FIRESTONE
MODEL 4-A-133

TRADE NAME	Firestone Model 4-A-133 (Code 1-4-UX5X5)
SUPPLIER	Firestone Tire & Rubber Co., 1200 Firestone Pkwy., Akron, Ohio
TYPE SET	AC Operated Radio-Phono Combination AM Superheterodyne Receiver
TUBES (Six)	Types 12BE6 Conv., 12BA6 IF Amp., 12AT6 Det.-AVC, 12AX7 AF Amp.-Phase Inverter, (2) 35L6GT Output
POWER SUPPLY	110-120 Volts AC-60 Cycles — RATING .35 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	535-1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (grid) of 12BE6 (V1). Low side to B-	455KC (400~Mod)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.		Loop	1620KC	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	1400KC	Tune to 1400KC signal	"	A6	"

FOR SERVICE INFORMATION ON RECORD CHANGER UNIT - SEE V-M MODEL 950 - PHOTOFACT SET #216 - FOLDER #11 OR RECORD CHANGER MANUAL CM-5.

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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PARTS LIST AND DESCRIPTIONS

FIRESTONE
MODEL 4-A-133 (Code 1-4-UX5X5)

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA: FIRESTONE PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RETMA BASE TYPE	NOTES
V1	Converter	12BE6	12BE6	7CH	
V2	IF Amplifier	12BA6	12BA6	7BK	
V3	Det.-AVC	12AT6	12AT6	7BT	
V4	RF Amplifier-Phase Inverter	12AX7	12AX7	9A	
V5	Output	35L6GT	35L6GT	7S	
V6	Output	35L6GT	35L6GT	7S	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: FIRESTONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	40	150	CC-1021	PRS150/80-40-20		BBRT84215		TCT3117	TVA-3455	Yellow
B	80	150								Red
C	20	150								Blue
C2	10	500		1468-100	D6-100	5W5Q1	GP1K-100	MC215	1FM-41	
C3	10000		CC-103-5	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C4	10	500		1468-100	D6-100	5W5Q1	GP1K-100	MC215	1FM-41	
C5	.05	200	CP-503-2	P288-05	DF-503	CUB2S5		PT415	2TM-S5	
C6A	100		♦PC-50	♦PA-97-1	♦PC-50	♦111TM1	♦1403-01	UC-531	♦D-1	
B	100							UC-531		
C7	.05	200	CP-503-2	P288-05	DF-503	CUB2S5		PT415	2TM-S5	
C8	.05	200	CP-503-2	P288-05	DF-503	CUB2S5		PT415	2TM-S5	
C9	5000		CC-502-5	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C10	.05	200	CP-503-2	P288-05	DF-503	CUB2S5		PT415	2TM-S5	
C11	.1	200	CP-104-2	P288-1	DF-104	CUB2P1		PT401	2TM-P1	
C12	270			SI270	D6-271		GP2K-271	UC-5327	5GA-T27	Note 1
C13	.1	400	CP-104-4	P488-1	DF-104	CUB4P1		PT401	4TM-P1	
C14	.1	400	CP-104-4	P488-1	DF-104	CUB4P1		PT401	4TM-P1	
C15	.05	400	CP-503-2	P488-05	DF-503	CUB4S5		PT415	4TM-S5	
C16	.05	400	CP-503-2	P488-05	DF-503	CUB4S5		PT415	4TM-S5	
C17	.1	400	CP-104-4	P488-1	DF-104	CUB4P1		PT401	4TM-P1	

Note 1. Some versions use 100MMF in this application (part no. CCT-101-25).
♦ Items C6A, C6B and R7 are combined in one unit.

CONTROLS

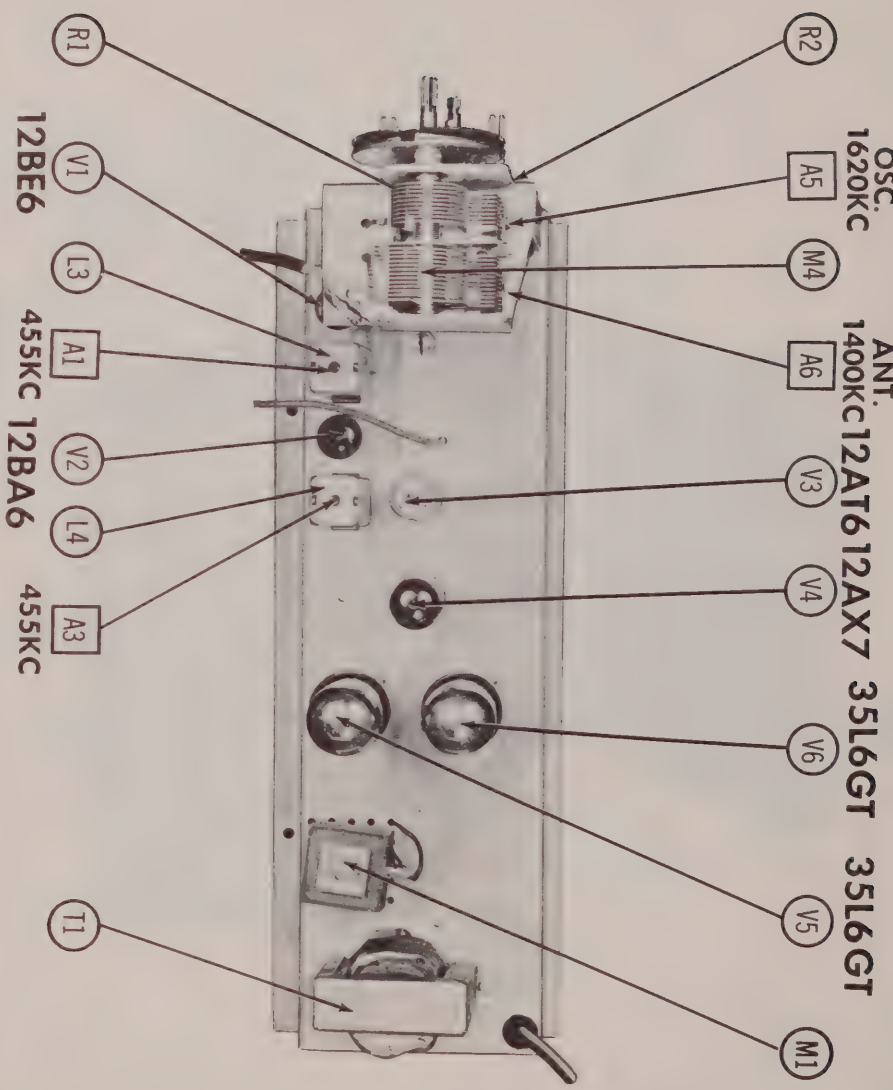
ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: FIRESTONE PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	7500Ω	½	VC-3	Q11-115	A47-7500-S	AB-13	U-20	Tone
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R1A
C	Switch		Not Req.	76-1	SWE-12	KB-1	US-26	Attach to R1A
R2A	3.25Meg	½	VC-1			ABT-8515		Volume - tapped @ 300KΩ
B	Shaft		Not Req.			AK-4		Attach to R2A

RESISTORS

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: FIRESTONE PART No.	IRC PART No.	NOTES
R3	470KΩ	½	RC-474-3	BTS-470K	
R4	22KΩ	½	RC-223-2	BTS-22K	
R5	1.5Meg	½	RC-155-2	BTS-1.5Meg	
R6	220Ω	½	RC-221-2	BTS-220	
R7	47KΩ	½	†PC-50	BTS-47K	
R8	220KΩ	½	RC-224-2	BTS-220K	
R9	47KΩ	½	RC-473-3	BTS-47K	
R10	10Meg	½	RC-106-2	BTS-10Meg	
R11	4300Ω	½	RC-432-3	BTS-4300	
R12	220KΩ	½	RC-224-2	BTS-220K	
R13	47KΩ	½	RC-473-3	BTS-47K	
R14	10KΩ	½	RC-103-3	BTS-10K	
R15	220KΩ	½	RC-224-2	BTS-220K	
R16	470KΩ	½	RC-479-3	BTS-470K	
R17	75Ω	2	RC-750-9		
R18	220KΩ	½	RC-474-3	BTS-220K	
R19	18KΩ	½	RC-183-3	BTS-18K	
R20	2200Ω	1	RC-222-5	BTA-2200	
R21	100Ω	2	RC-101-8		
R22	22Ω	2	RC-220-9		

† Items R7, C6A and C6B are combined in one unit.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA FIRESTONE PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	NOTES
T1	5.7KΩ	1.5Ω	TR-107						

SPEAKER

ITEM No.	RATINGS SIZE	RATINGS FIELD	RATINGS V. C. IMP.	REPLACEMENT DATA FIRESTONE PART No.	JENSEN PART No.	QUAM PART No.	NOTES
SP1	6"	PM	3Ω	SP-66	ST-110 Mod. P6-V	6A21	
SP2	6"	PM	3Ω	SP-66	ST-110 Mod. P6-V	6A21	

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA FIRESTONE PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	Ant. Coil	.4Ω		LP-FE-14				
L2	Osc. Coil	.6Ω	5.5Ω	LC-10	14-1073 *		69-Osc. ■	
L3	Input IF	20Ω	20Ω	LF-50	16-6758	BC-352	12-C1	
L4	Output IF	20Ω	20Ω	LF-50	16-6758	BC-353	12-C2	

* Leads sufficient mounting support.
■ Drill new mounting hole.

SELENIUM RECTIFIER

ITEM No.	RATING CURRENT	REPLACEMENT DATA FIRESTONE PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	SARKES TARZIAN PART No.	SELETRON PART No.	NOTES
M1	.102ADC	SE-1002	1005A	RS150	6S150	150	5P1	

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA FIRESTONE PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	SHURE PART No. CARTRIDGE	SHURE PART No. NEEDLE	ELECTRO-VOICE PART No. CARTRIDGE	ELECTRO-VOICE PART No. NEEDLE	REMARKS
M2	9980SC					47	0-1 or S-1 & 0-3	

ELECTRO-VOICE NEEDLE LISTINGS SHOWN ABOVE ARE SPECIFIED FOR THEIR RESPECTIVE REPLACEMENT CARTRIDGE LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENT SEE BELOW.

PHONO NEEDLE

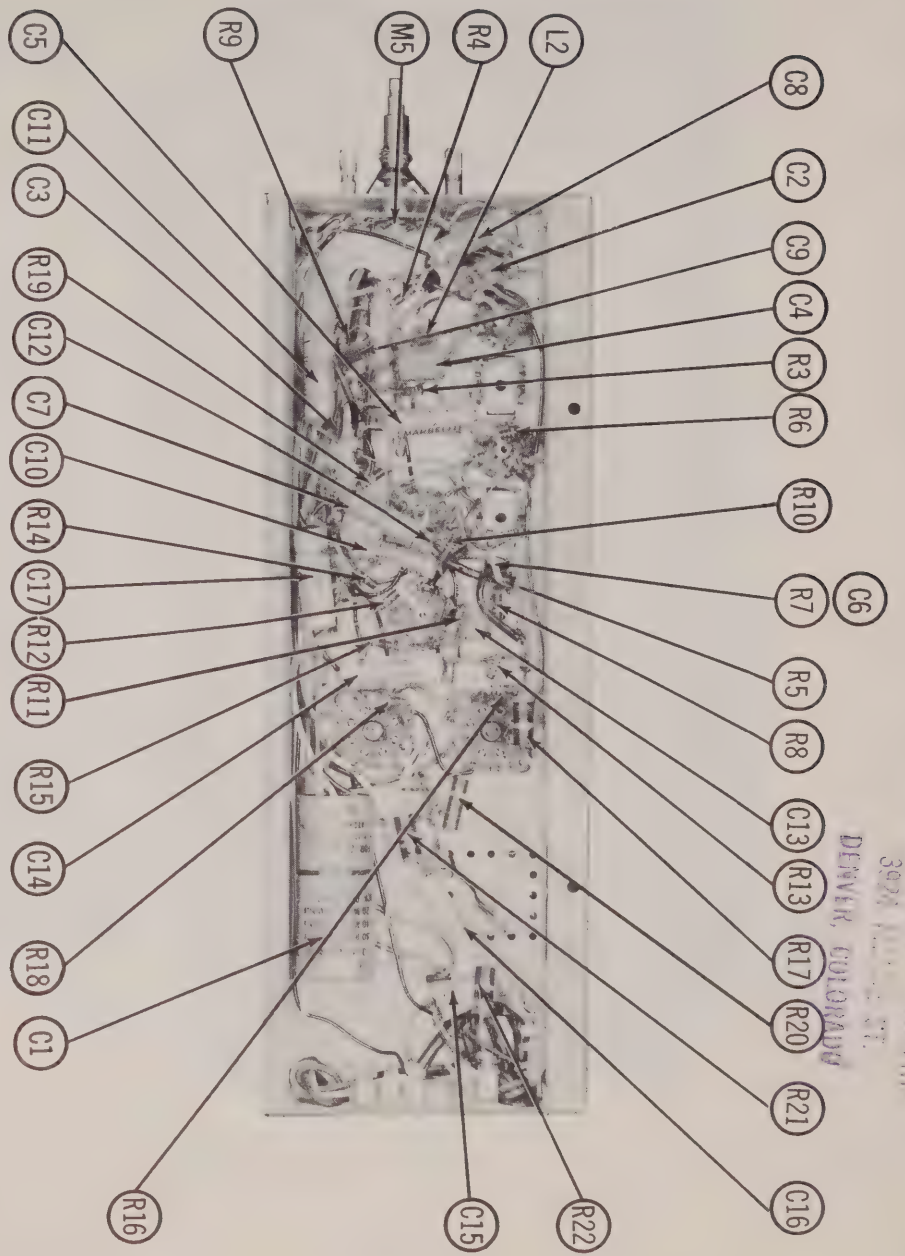
(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA FIRESTONE PART No.	JENSEN PART No.	PERMO PART No.	WALCO PART No.	REMARKS
M3	9987S	†S-66 or ♦†S-66SD or ♦S-66D	†AC-434 or †♦AC-434D1 or †♦AC-434D2 or ♦AC-434D	†W-75TPS or ♦†W-75DS or ♦W-75TPD	† Jewel ♦ Diamond

MISCELLANEOUS

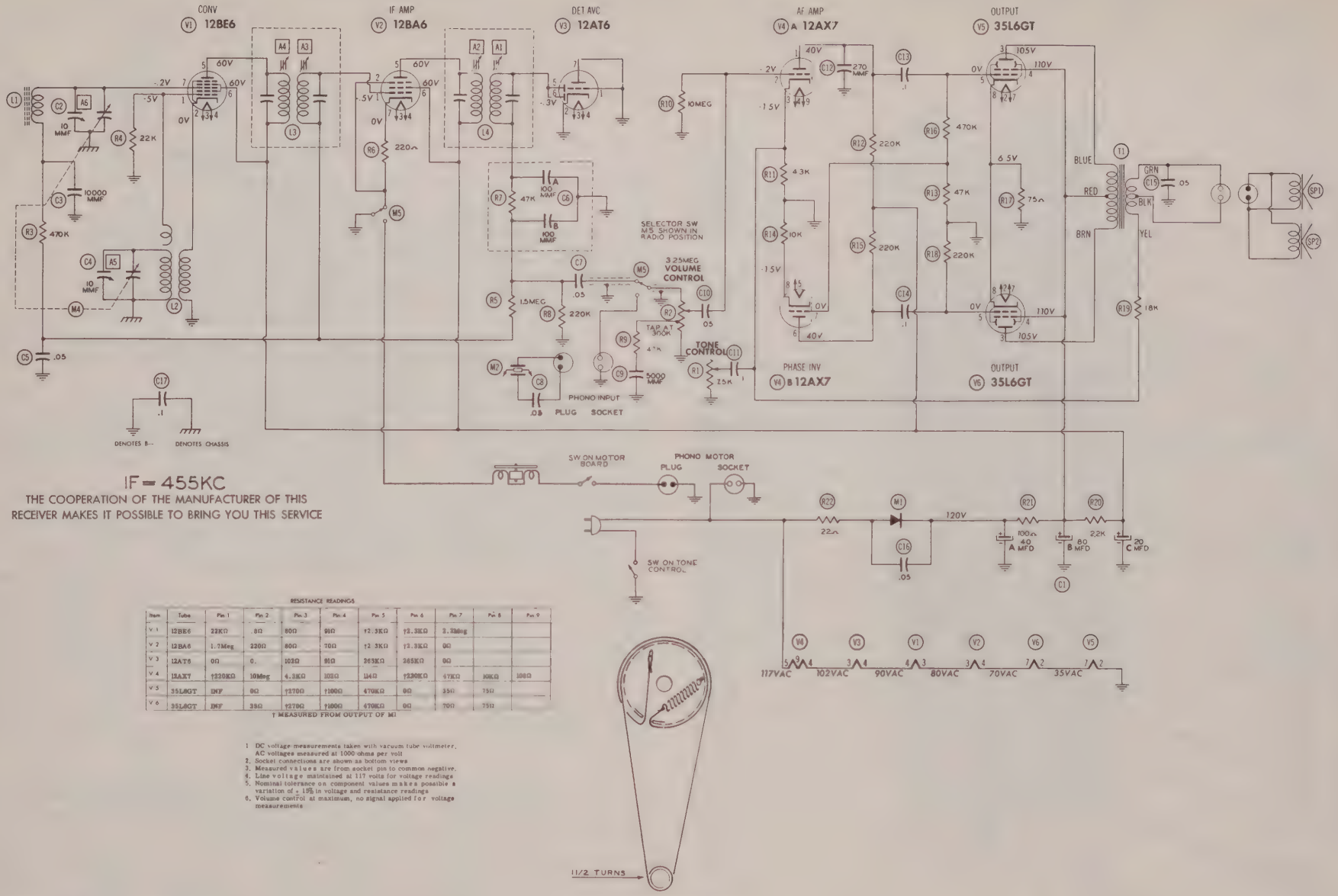
ITEM No.	PART NAME	FIRESTONE PART No.	NOTES
M4	Tuning Cap.	CV-52	47-472MMF, 29-195MMF
M5	Switch	SW-26	Radio-Phono
	Cabinet	CA-1006	
	Knob	KN-10805-1	Selector
	Knob	KN-330V	Volume
	Knob	KN-330ST	Tone-on-off
	Knob	KN-700-7	Radio-phono
	Knob	KN-5206-5D	Tuning

CHASSIS—BOTTOM VIEW



L. F. DRAKE CO.
392[illegible] ST.
DENVER, COLORADO

FIRESTONE
MODEL 4-A-133 (Code 1-4-UX5X5)



IF = 455KC

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	12BE6	22KΩ	8Ω	80Ω	91Ω	†2.3KΩ	†2.3KΩ	3.3Meg		
V 2	12BA6	1.7Meg	220Ω	80Ω	70Ω	†2.3KΩ	†2.3KΩ	0Ω		
V 3	12AT6	0Ω	0.	103Ω	91Ω	265KΩ	265KΩ	0Ω		
V 4	12AX7	†220KΩ	10Meg	4.3KΩ	103Ω	114Ω	†220KΩ	47KΩ	10KΩ	100Ω
V 5	35L6GT	INF	0Ω	†270Ω	†100Ω	470KΩ	0Ω	35Ω	75Ω	
V 6	35L6GT	INF	35Ω	†270Ω	†100Ω	470KΩ	0Ω	70Ω	75Ω	

† MEASURED FROM OUTPUT OF M1

1. DC voltage measurements taken with vacuum tube voltmeter. AC voltages measured at 1000 ohms per volt
2. Socket connections are shown as bottom views
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings
6. Volume control at maximum, no signal applied for voltage measurements

DIAL CORD STRINGING

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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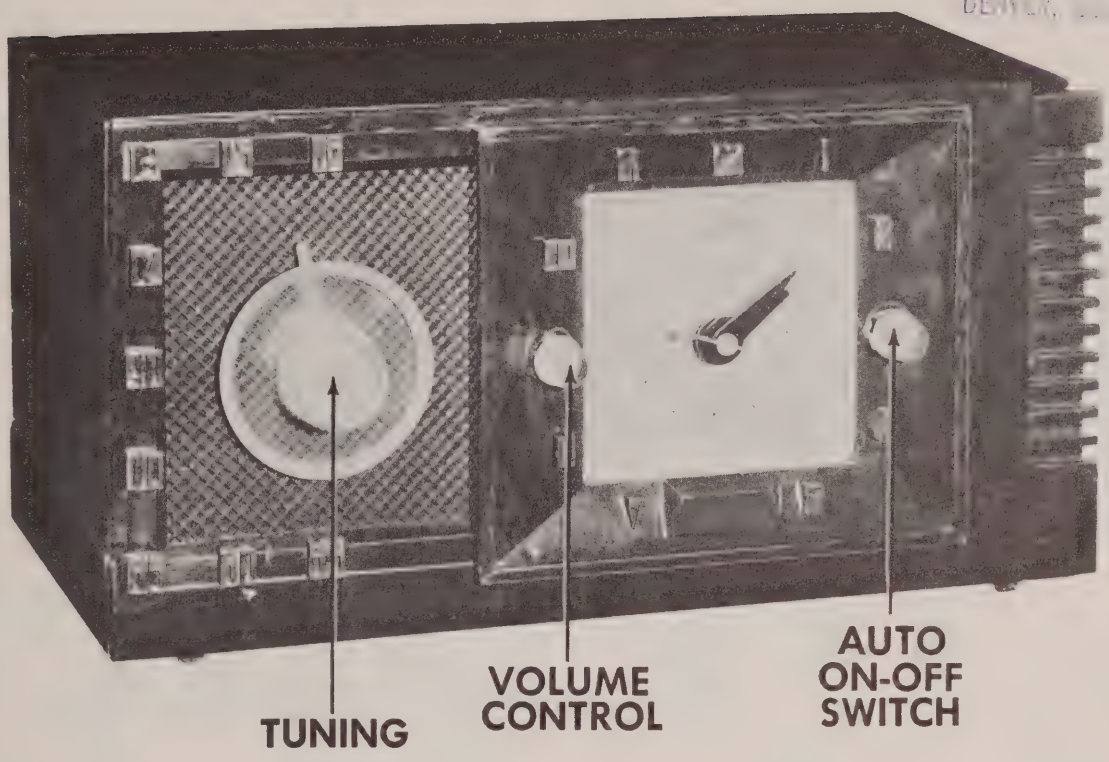
FIRESTONE
MODELS 4-A-135, 4-A-136

PROPERTY OF
L. F. [illegible]
[illegible] ST.
DENVER, COLORADO

FIRESTONE
MODELS 4-A-135, 4-A-136



FIRESTONE
MODELS 4-A-135, 4-A-136

TRADE NAME	Firestone Model 4-A-135, 4-A-136
SUPPLIER	Firestone Tire & Rubber Co., 1200 Firestone Pkwy., Akron, Ohio
TYPE SET	AC Operated AM Superheterodyne Receiver With Electric Clock
TUBES	(Four) Types 12BE6 Conv., 12AV6 Det.-AVC-AF Amp., 50C5 Output, 35W4 Rectifier
POWER SUPPLY	105-120 Volts AC-60 Cycles — RATING .26 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	535-1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (grid) of 12BE6 (V1). Low side to chassis.	455KC (400∿ Mod)	Tuning gang fully open	Across voice coil	A1, A2	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.		Loop	1620KC	"	"	A3	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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PARTS LIST AND DESCRIPTIONS

FIRESTONE MODEL 4-A-135

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		FIRESTONE PART No.	STANDARD REPLACEMENT		
V1	Converter	12BE6	12BE6	7CH	
V2	Det.-AVC-AF Amp.	12AV6	12AV6	7BT	
V3	Output	50C5	50C5	7CV	
V4	Rectifier	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	FIRESTONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	■50	150	40736	AFH3-77		C056		FP310	TVL-3424	
B	▲30	150								
C	20	25								
C2	47			BPD-00047	SI47	G033	GP1K-470	UC-5447	5GA-Q47	Note 1
C3	6									
C4	20000		40053-203	BPD-02	DD-203	K085		DC-512	5HK-S2	
C5A	220									
B	2000									
C	5000		♦41696	♦PA-113-1	♦PC-150	♦116TM1	♦1408-01		♦DT-1	
D	250									
E										
C6	10000		40053-103	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C7	20000		40053-203	BPD-02	DD-203	K085		DC-512	5HK-S2	
C8	20000		40053-203	BPD-02	DD-203	K085		DC-512	5HK-S2	

Note 1. Not used in all Models.

♦ Items C5A, C5B, C5C, C5D, C5E, R4A, R4B and R4C are combined in one unit. When replacing items separately items C5D and C5E should total 250MMF.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	FIRESTONE PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1	1Meg	½	A41558					Volume

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	FIRESTONE PART No.	IRC PART No.	
R2	22KΩ	½	20061-223	BTS-22K	
R3	2.2Meg	½	20061-225	BTS-2.2Meg	
R4A	6.8Meg	½		BTS-6.8Meg	
B	470KΩ	½	♦	BTS-470K	
C	470KΩ	½		BTS-470K	

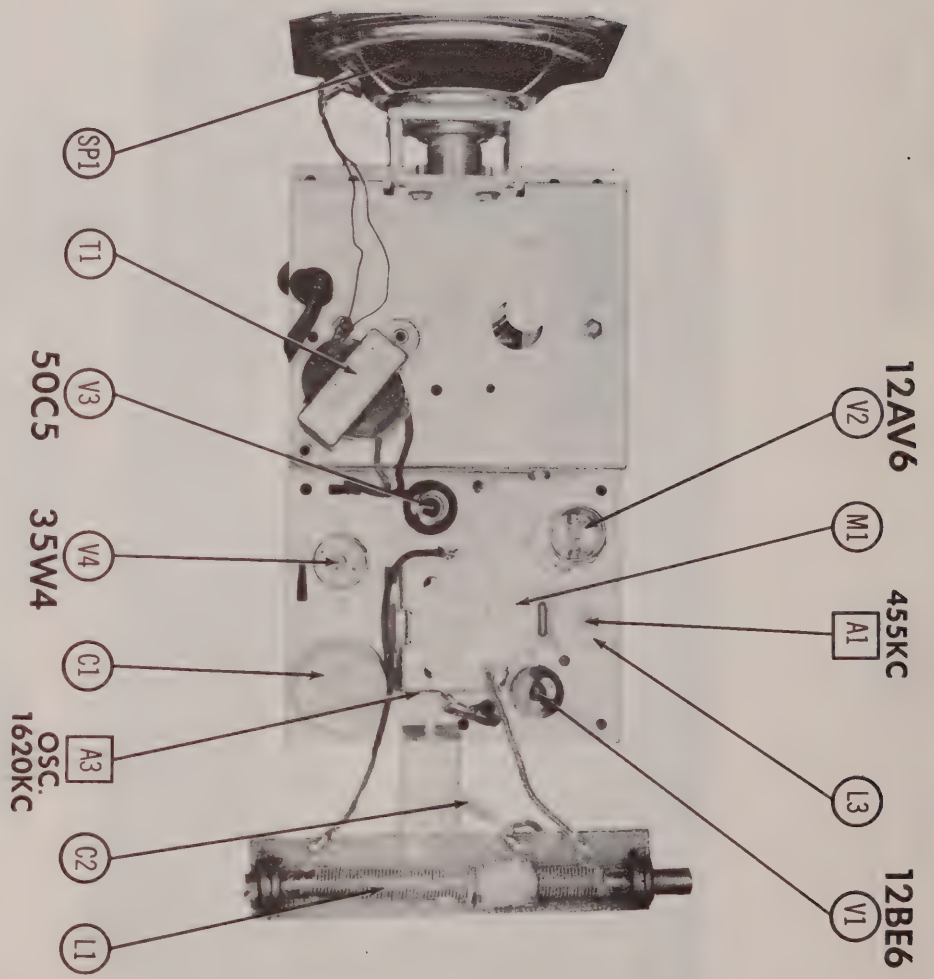
ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	FIRESTONE PART No.	IRC PART No.	
R5	120Ω	½	22381-121	BTS-120	
R6	2200Ω	1	20070-222	BTA-2200	
R7	47Ω	2	42235	BTB-47	
R8	330KΩ	½	20061-334	BTS-330K	

♦ Items R4A, R4B, R4C, C5A, C5B, C5C, C5D and C5E are combined in one unit.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	FIRESTONE PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	
T1	2.4KΩ	3.3Ω	41706-1	A-3332	A-3025	S-12X	Z1101	26S58 ①	① Drill one new mounting hole.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	FIRESTONE PART No.	JENSEN PART No.	QUAM PART No.	
SP1	4"	PM	3.3Ω	41629	ST-113 Mod. P4-X	4A07	

COILS (RF-IF)

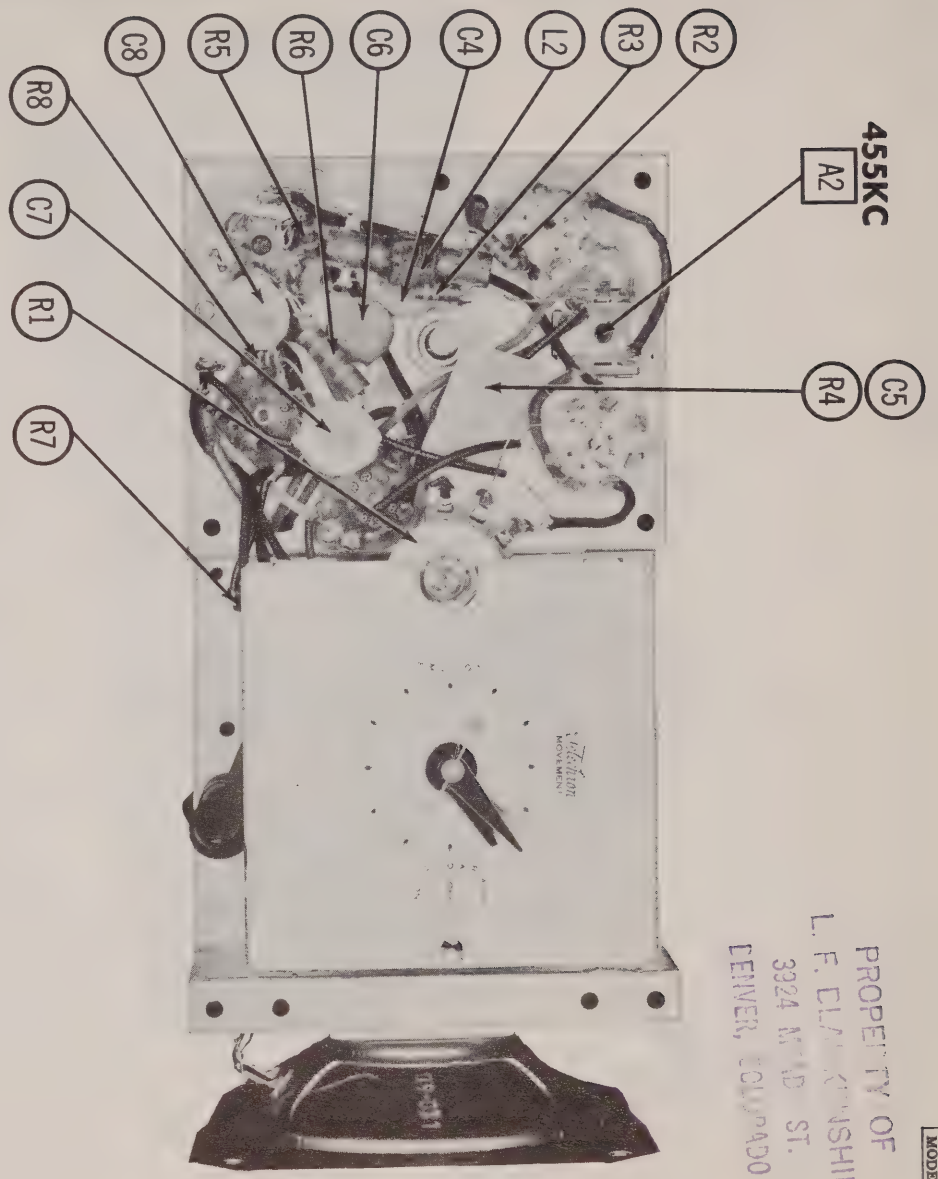
ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	FIRESTONE PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Ant. Coil	.8Ω	.3Ω	41695-1				
L2	Osc. Coil	.8Ω	8.5Ω	41707-1	14-1073		69-Osc.■	
L3	IF Trans.	18Ω*	18Ω	41168-3				

* Tapped @ 1.5Ω
■ Drill mounting hole.

MISCELLANEOUS

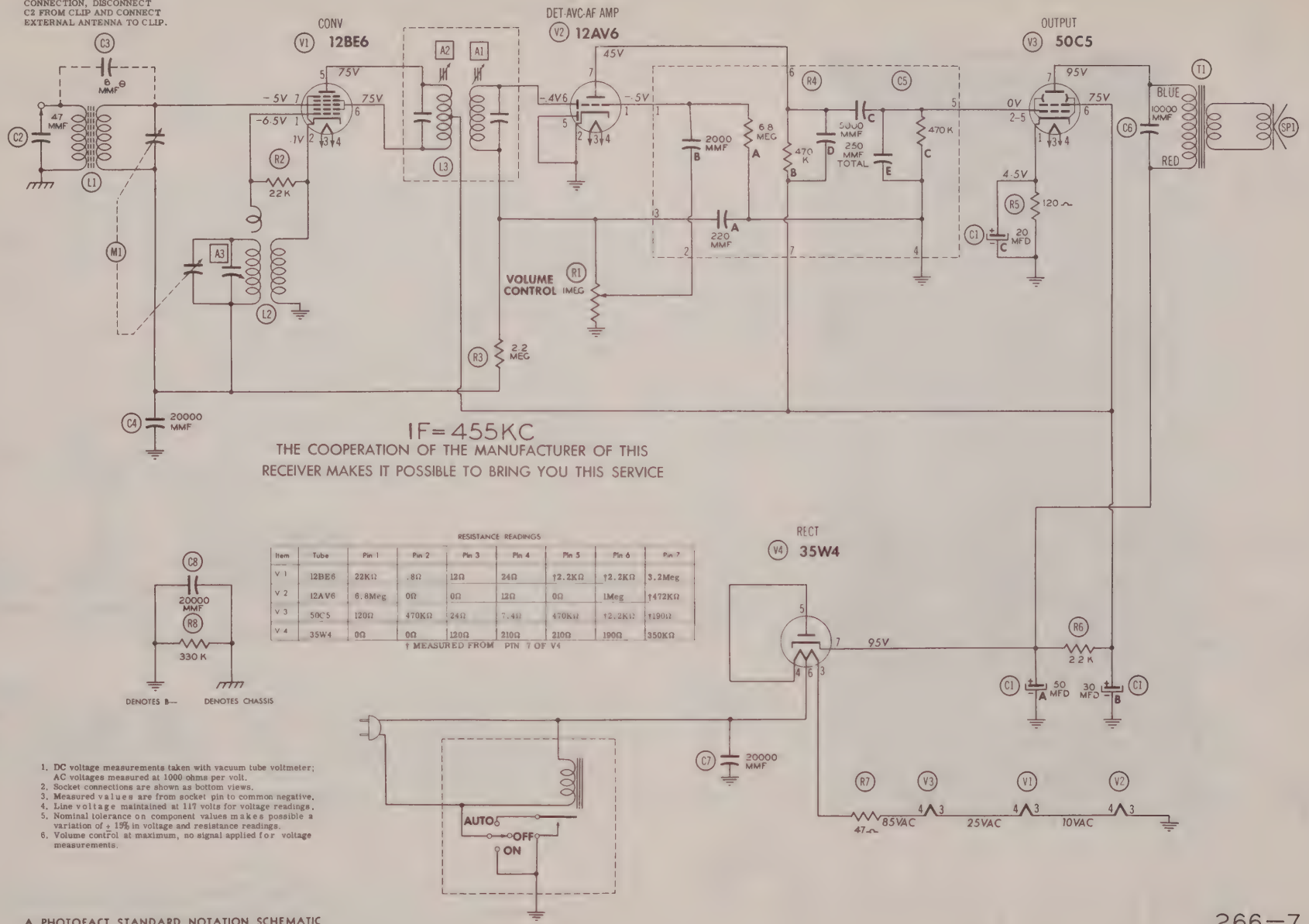
ITEM No.	PART NAME	FIRESTONE PART No.	NOTES
M1	Tuning Cap.	41538	10-280MMF, 10-110MMF
	Cabinet	41673-1	Ivory - Model 849T
	Cabinet	41673-2	Bitter Green - Model 849T
	Cabinet	41673-3	California Tan - Model 849T
	Cabinet	41673-4	Rosewood - Model 848T
	Knob	41607	Tuning
	Knob	41606	Dial Pointer
	Knob	25233-3	Clock & volume
	Timer	41633-1	Clock
	Clock Crystal	41531	

CHASSIS—BOTTOM VIEW



PROPERTY OF
L. F. CLARKSHIP
3324 MAIN ST.
DENVER, COLORADO

FIRESTONE
MODEL 4-A-135



IF=455KC

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12BE6	22KΩ	.8Ω	12Ω	24Ω	†2.2KΩ	†2.2KΩ	3.2Meg
V 2	12AV6	6.8Meg	0Ω	0Ω	12Ω	0Ω	1Meg	†472KΩ
V 3	50C5	120Ω	470KΩ	24Ω	7.4Ω	470KΩ	†2.2KΩ	†190Ω
V 4	35W4	0Ω	0Ω	120Ω	210Ω	210Ω	190Ω	350KΩ

† MEASURED FROM PIN 7 OF V4

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

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L. F. D[illegible]ENSHIP
3824 M[illegible] ST.
DENV[illegible]ADO

MASCO
MODEL CM-8

MASCO
MODEL CM-8

TRADE NAME	Masco Model CM-8
MANUFACTURER	Mark Simpson Mfg. Co., Inc., 32-28 49th St., Long Island City 3, N. Y.
TYPE SET	AC Operated 3 Channel 8 Watt Audio Amplifier
TUBES (Five)	Types 6SC7 Pre-Amp. -AF Amp., 6SL7GT AF Amp. Phase Inverter, (2) 6V6GT Output, 6X5GT Rectifier
POWER SUPPLY	110-120 Volts AC - 50/60 Cycles RATING .38 Amp. @ 117 Volts AC

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PARTS LIST AND DESCRIPTIONS

MASCO MODEL CM-8

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		MASCO PART No.	STANDARD REPLACEMENT		
V1	Pre-amp-AF Amp.	6SC7	6SC7	8S	
V2	AF Amp. -Phase Inverter	6SL7GT	6SL7GT	8BD	
V3	Output	6V6GT	6V6GT	7S	
V4	Output	6V6GT	6V6GT	7S	
V5	Rectifier	6X5GT	6X5GT	6S	

CAPACITORS

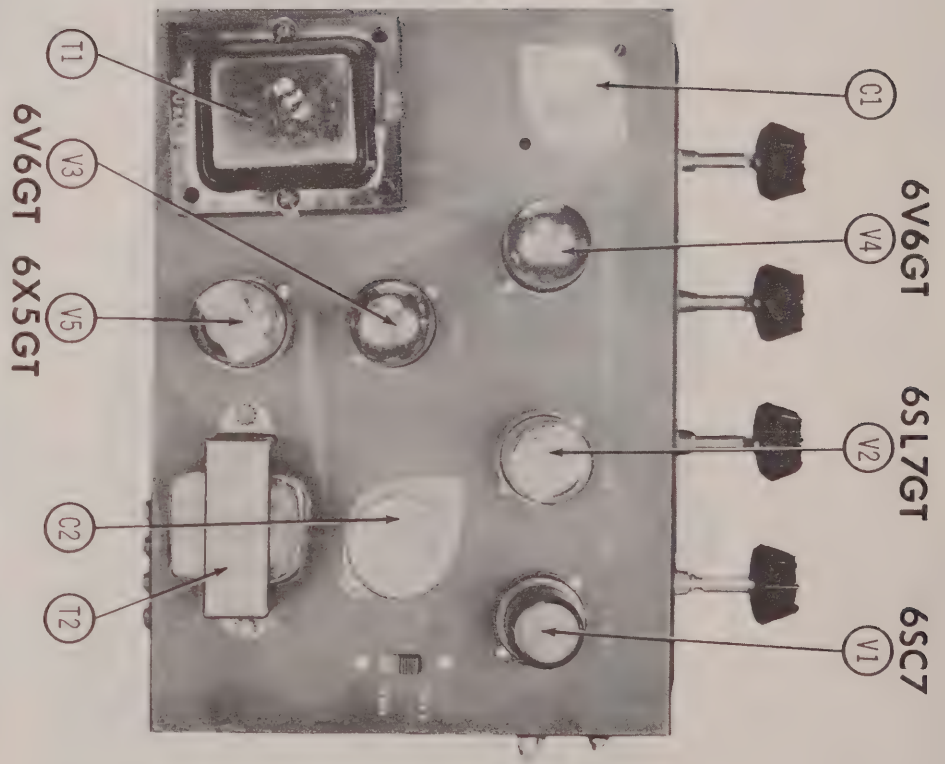
Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	MASCO PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	▲10	450		AFH2-47		B037		FP231	TVL-2750	
B	■10	450								
C2A	▲5	450		AFH4-09		D008		WP433.6		
B	5	450								
C	▲5	450								
D	■5	450								
C3	10	50		PRS50/10		BR105		TC32	TVA-1304	
C4	100	500		1468-101	D6-101	5W5T1	GP1K-101	MC235	1FM-31	
C5	.05	200		P288-05	DF-503	CUB2S5		PT415	2TM-S5	
C6	.02	600		P688-02	DF-203	CUB6S2	817-02	PT612	6TM-S2	
C7	2000	500		1467-202	D6-202	1W5D1	GP2-333-202	MC457	1FM-22	
C8	.02	600		P688-02	DF-203	CUB6S2	817-02	PT612	6TM-S2	
C9	50	500		1468-500	D6-500	5W5Q5	GP1K-500	MC225	1FM-45	
C10	.1	200		P288-1	DF-104	CUB2P1		PT401	2TM-P1	
C11	.006	600		P688-006	D6-602	CUB6D6	GP2-333-602	PT626	6TM-D6	
C12	.05	600		P688-05	DF-503	CUB6S5		PT615	6TM-S5	
C13	.05	600		P688-05	DF-503	CUB6S5		PT615	6TM-S5	
C14	.1	600		P688-1	DF-104	CUB6P1		PT601	6TM-P1	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	MASCO PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	500KΩ	½	A-1661	Q13-133	A47-500K-Z	B-60	U-48	Volume
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R1A
R2A	500KΩ	½	A-1661	Q13-133	A47-500K-Z	B-60	U-48	Bass
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R2A
R3A	500KΩ	½	A-1661	Q13-133	A47-500K-Z	B-60	U-48	Treble
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R3A

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA MASCO PART No.	REPLACEMENT DATA IRC PART No.	NOTES
R4	47KΩ	½		BTS-47K	
R5	1Meg	½		BTS-1Meg	
R6	47KΩ	½		BTS-47K	
R7	5.6Meg	½		BTS-5.6Meg	
R8	100KΩ	½		BTS-100K	
R9	100KΩ	½		BTS-100K	
R10	100KΩ	½		BTS-100K	Note 1
R11	2.7Meg	½		BTS-2.7Meg	
R12	100Ω	½		BTS-100	
R13	2200Ω	½		BTS-2200	
R14	270KΩ	½		BTS-270K	
R15	18KΩ	½		BTS-18K	

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA MASCO PART No.	REPLACEMENT DATA IRC PART No.	NOTES
R16	2200Ω	½		BTS-2200	
R17	270KΩ	½		BTS-270K	
R18	100KΩ	½		BTS-100K	
R19	470KΩ	½		BTS-470K	
R20	270Ω	2		BTB-270	
R21	470KΩ	½		BTS-470K	
R22	2200Ω	½		BTS-2200	
R23	3300Ω	½		BTS-3300	
R24	2200Ω	2		BTB-2200	
R25	47Ω	1			
R26	47Ω	1			

Note 1: Not used in some versions.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	REPLACEMENT DATA MASCO PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.
T1	117VAC @ .38A	522VCT .064ADC	6.3VAC @ 2.2A		P-6	PM-8420 ①	P-3048	R-10B ① ②	P9205 ② ③	26R31U

① Drill one new mounting hole.
② Tape 5V winding.
③ Tape 6.3VCT.

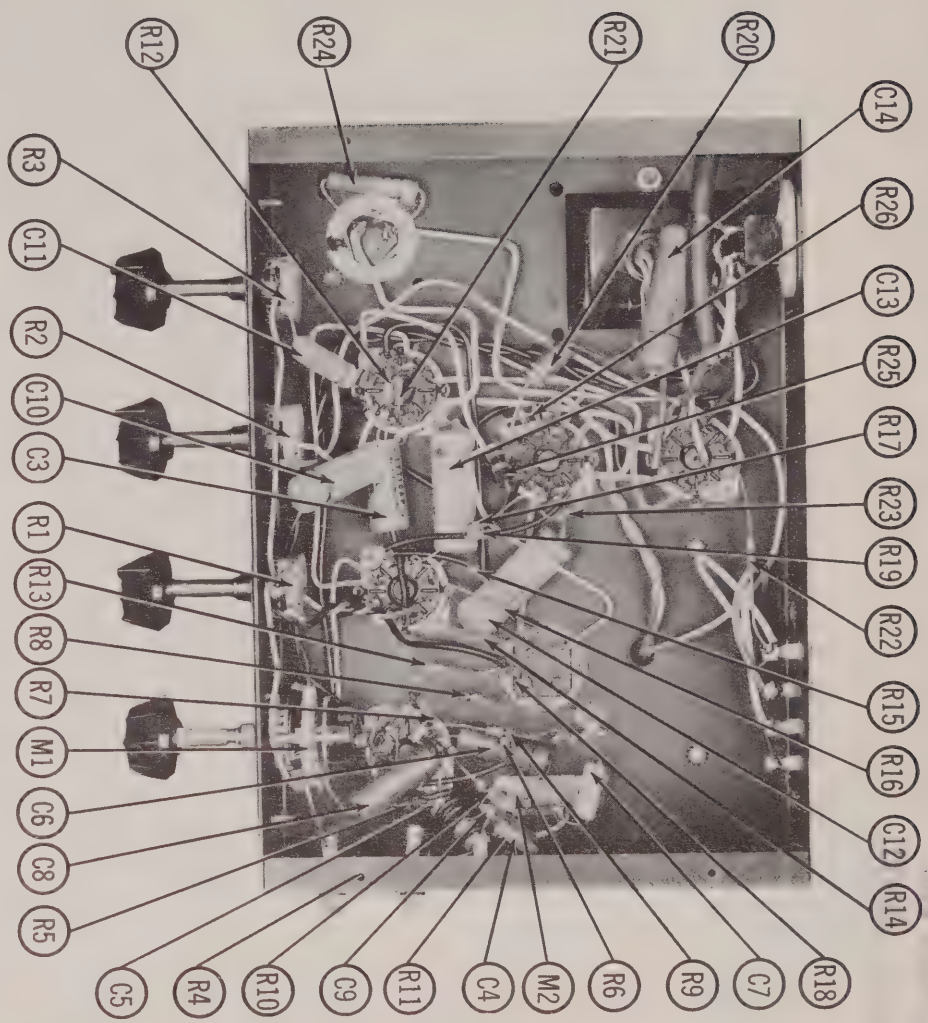
TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA MASCO PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	NOTES
T2	9.8KΩ	16Ω Tap @ 8Ω @ 4Ω	T-810		A-3027 ①		Z1404 ②	26S59	① Use correct secondary taps. ② Drill one new mounting hole.

MISCELLANEOUS

ITEM No.	PART NAME	MASCO PART No.	NOTES
M1	Switch		On-Off-Phono-Radio
M2	Switch		Mag.-Crystal

CHASSIS—BOTTOM VIEW



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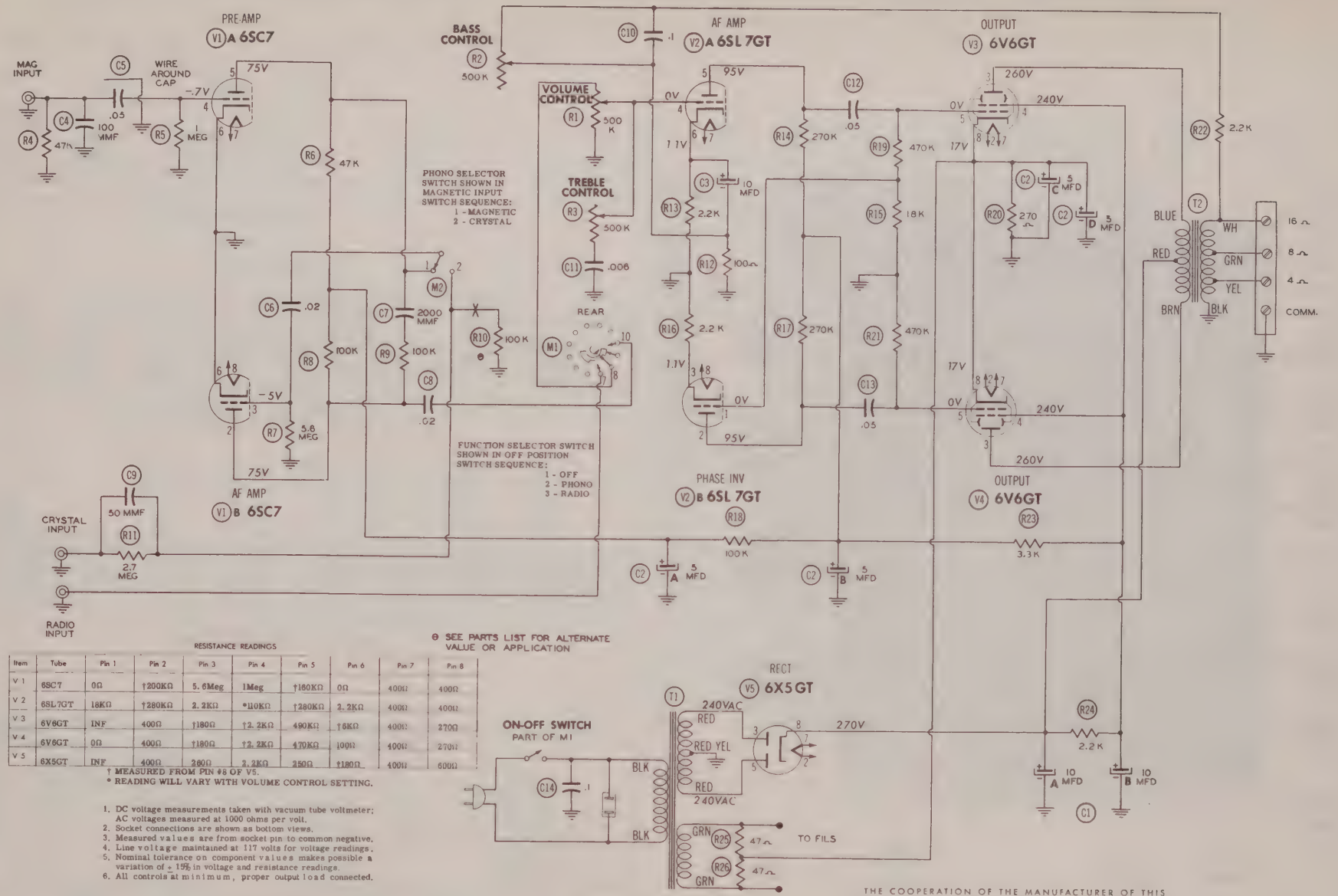

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	6SC7	0Ω	†200KΩ	5.6Meg	1Meg	†160KΩ	0Ω	400Ω	400Ω
V 2	6SL7GT	18KΩ	†280KΩ	2.2KΩ	*110KΩ	†280KΩ	2.2KΩ	400Ω	400Ω
V 3	6V6GT	INF	400Ω	†180Ω	†2.2KΩ	490KΩ	†6KΩ	400Ω	270Ω
V 4	6V6GT	0Ω	400Ω	†180Ω	†2.2KΩ	470KΩ	100Ω	400Ω	270Ω
V 5	6X5GT	INF	400Ω	260Ω	2.2KΩ	250Ω	†180Ω	400Ω	600Ω

† MEASURED FROM PIN #8 OF V5.
* READING WILL VARY WITH VOLUME CONTROL SETTING.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

THE COOPERATION OF THE MANUFACTURER OF THIS EQUIPMENT MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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MOTOROLA MODELS 54L1, 54L2, 54L3, 54L4, 54L5, 54L6 (Ch. HS-414)

PROPERTY OF L. F. D.

MOTOROLA MODELS 54L1, 54L2, 54L3, 54L4, 54L5, 54L6 (Ch. HS-414)

TRADE NAME	Motorola Models 54L1, 54L2, 54L3, 54L4, 54L5, 54L6 (Ch. HS-414)
MANUFACTURER	Motorola Inc., 4545 Augusta Blvd., Chicago 51, Ill.
TYPE SET	Three Power Portable AM Superheterodyne Receiver
TUBES (Four)	Types 1V6 Mixer-Osc., 1AH4 IF Amp., 1AJ5 Det-AVC-AF Amp., 3S4 Output
POWER SUPPLY	110-120 Volts AC-DC (or) 3 Volts "A" Supply & 67½ Volts "B" Supply
RATING	.15 Amp. @ 117 Volts AC (or) 135MA @ 3 Volts DC & 8.5MA @ 67½ Volts DC
TUNING RANGE—BROADCAST	535KC - 1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Use battery power, if possible. If AC power is used, use an isolation transformer when available. If not, connect a .1MFD capacitor in series with low side of the signal generator and B-.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1	.1MFD	High side to antenna stator lug on tuning gang. Low side to chassis.	455KC (400∿ Mod.)	Tuning gang fully open.	Across voice coil.	A1, A2 A3	Adjust for maximum output. If AC power is used without an isolation transformer, reduce dummy antenna to 200MMF to reduce hum modulation.
2	"	"	1620KC	"	"	A4	"
3		Loop	1400KC	Tune to 1400KC signal.	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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PARTS LIST AND DESCRIPTIONS

MOTOROLA
MODEL 54L1 (Ch. HS-414)

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		MOTOROLA PART No.	STANDARD REPLACEMENT		
V1	Mixer - Osc.	1V6	1V6		
V2	IF Amplifier	1AH4	1AH4		
V3	Det.-AVC-AF Amp.	1AJ5	1AJ5		
V4	Output	3S4	3S4	7BA	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	MOTOROLA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	■40	150	23B631123						R1257	
B	▲40	150								
C	250	10								
C2	.05	200	8A120842							Note 1
C3	5.6		21R120545	SI5.6NP0						
C4	10		21R120562							
C5	10000		21R120853	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C6	.05	200	8A120842							Note 1
C7	10000		21R120853	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C8	10000		21R120853	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C9	10000		21R120853	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C10A	2000									
B	150									
C	10000		♦21B631414	♦PA-176					♦DP-1	
D	150									
E	5000									
C11	5000		21R121165	BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C12	.05	400	8K121268							Note 1

Note 1. Special unit mounted vertically to plated chassis.
♦ Items C10A, C10B, C10C, C10D, C10E, R9A, R9B, R9C and R9D are combined in one unit.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	MOTOROLA PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1	1Meg	½	18B631293					Volume & Switch

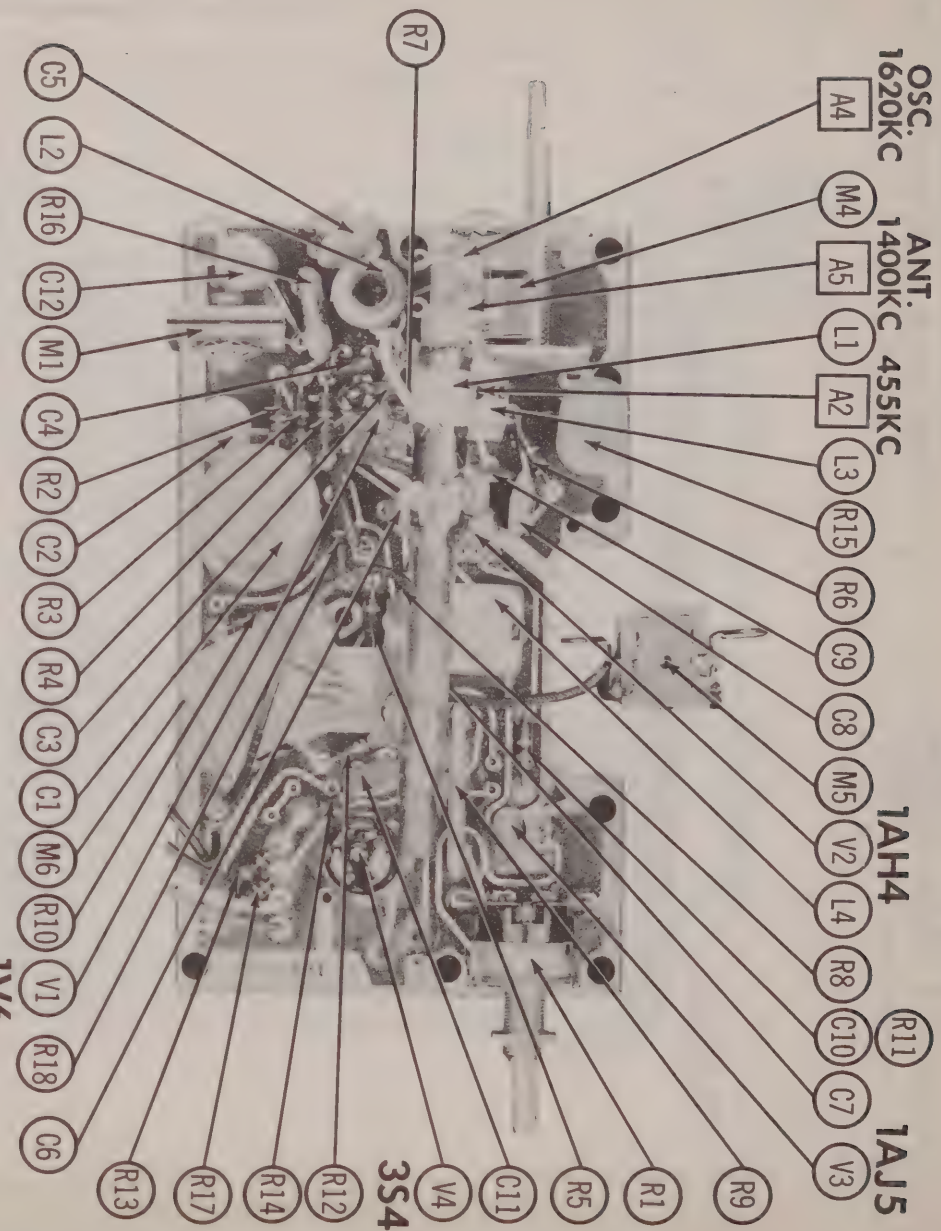
RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	MOTOROLA PART No.	IRC PART No.	
R2	470KΩ	½	6K121279	BTS-470K	
R3	1000Ω	½	6K121301	BTS-1000	
R4	27KΩ	½	6K121300	BTS-27K	
R5	6.8Meg	½		BTS-6.8Meg	Note 1
R6	4.7Meg	½	6K121277	BTS-4.7Meg	
R7	47KΩ	½	6K121299	BTS-47K	
R8	1Meg	½	6K119936	BTS-1Meg	
R9A	10Meg	½			
B	4.7Meg	½	♦21B631414		
C	1Meg	½			
D	3.3Meg	½			

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	MOTOROLA PART No.	IRC PART No.	
R10	270Ω	½	6K121303	BTS-270	
R11	33Ω	½	6K121304	BTS-33	
R12	270Ω	½	6K121303	BTS-270	
R13	1000Ω	½	6K121301	BTS-1000	
R14	270Ω	½	6K121303	BTS-270	
R15	2000Ω	10	17A631294		
R16	150Ω	5	6K119926		
R17	680Ω	½	6K121744	BTS-680	
R18	2700Ω	½	6K119626	BTS-2700	

Note 1: Some versions may use a 3.3Meg in this application.
♦ Items R9A, R9B, R9C, R9D, C10A, C10B, C10C, C10D and C10E are combined in one unit.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	MOTOROLA PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	
T1	7.8KΩ	3.4Ω	25B631208	A-3329	A-2927 ①	S-8X	Z1110	24S49	① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	MOTOROLA PART No.	JENSEN PART No.	QUAM PART No.	
SP1	4" X 6"	PM	3.4Ω	50C631209			

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	MOTOROLA PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Ant. Coil	1.8Ω		24B630365				
L2	Osc. Coil	4.6Ω	10Ω	24B631102			70-Osc. *	
L3	Input IF	16Ω	16Ω	24C631119			10-C1	
L4	Output IF	22Ω	32Ω	24C631118	16-6758	BC-353	12-C2	

* Leads sufficient mounting support.

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA						NOTES
	CURRENT	MOTOROLA PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	SARKES TARZIAN PART No.	SELETRON PART No.	
M1	.060A	48B631295	1263A	RS65	6S65	65	8J1	

BATTERIES

ITEM No.	VOLTAGE	MOTOROLA PART No.	REPLACEMENT DATA						INSTALLATION NOTES
			EVEREADY			BURGESS			
			"A"	"B"	"A-B"	"A"	"B"	"A-B"	
M2	1.5V		950			2R			Connect 2 in series.
M3	67.5V			477			P45		

PARTS LIST AND DESCRIPTIONS (Continued)

MISCELLANEOUS

ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M4	Tuning Cap.	19B631121	11-235MMF, 11-110MMF
M5	Switch	40A621656	Interlock
M6	Switch	40B631101	Change-over
	Cabinet	15K631577	Front section less handle, grille, and name plate - Model 54L1
	Cabinet	15K631578	Front section less handle, grille and name plate - Model 54L3
	Cabinet	15K631579	Front section less handle, grille and name plate - Model 54L4
	Cabinet	15E631471	Front section less handle, grille and name plate - Model 54L1
	Cabinet	15K631801	Front section less handle, grille and name plate - Model 54L5
	Cabinet	15K631802	Front section - less handle, grille and name plate -Model 54L6
	Cover	15E631473	Cabinet Rear - Model 54L1
	Cover	15K631580	Cabinet Rear - Model 54L2
	Cover	15K631581	Cabinet Rear - Model 54L3
	Cover	15K631582	Cabinet Rear - Model 54L4
	Cover	15K631803	Cabinet Rear - Model 54L5
	Cover	15K631804	Cabinet Rear - Model 54L6
	Grille	13K631995	Speaker - Models 54L1, 54L3, 54L6
	Grille	13C631216	Speaker - Models 54L2, 54L5
	Grille	13K631996	Speaker - Model 54L4
	Handle	55B631215	
	Knob	1V631167	Tuning
	Knob	1V631168	On-off-volume
	Medallion	13K630096	Models 54L1, 54L3, 54L6
	Medallion	13K731365	Models 54L2,54L4, 54L5
	Name Plate	33B631819	

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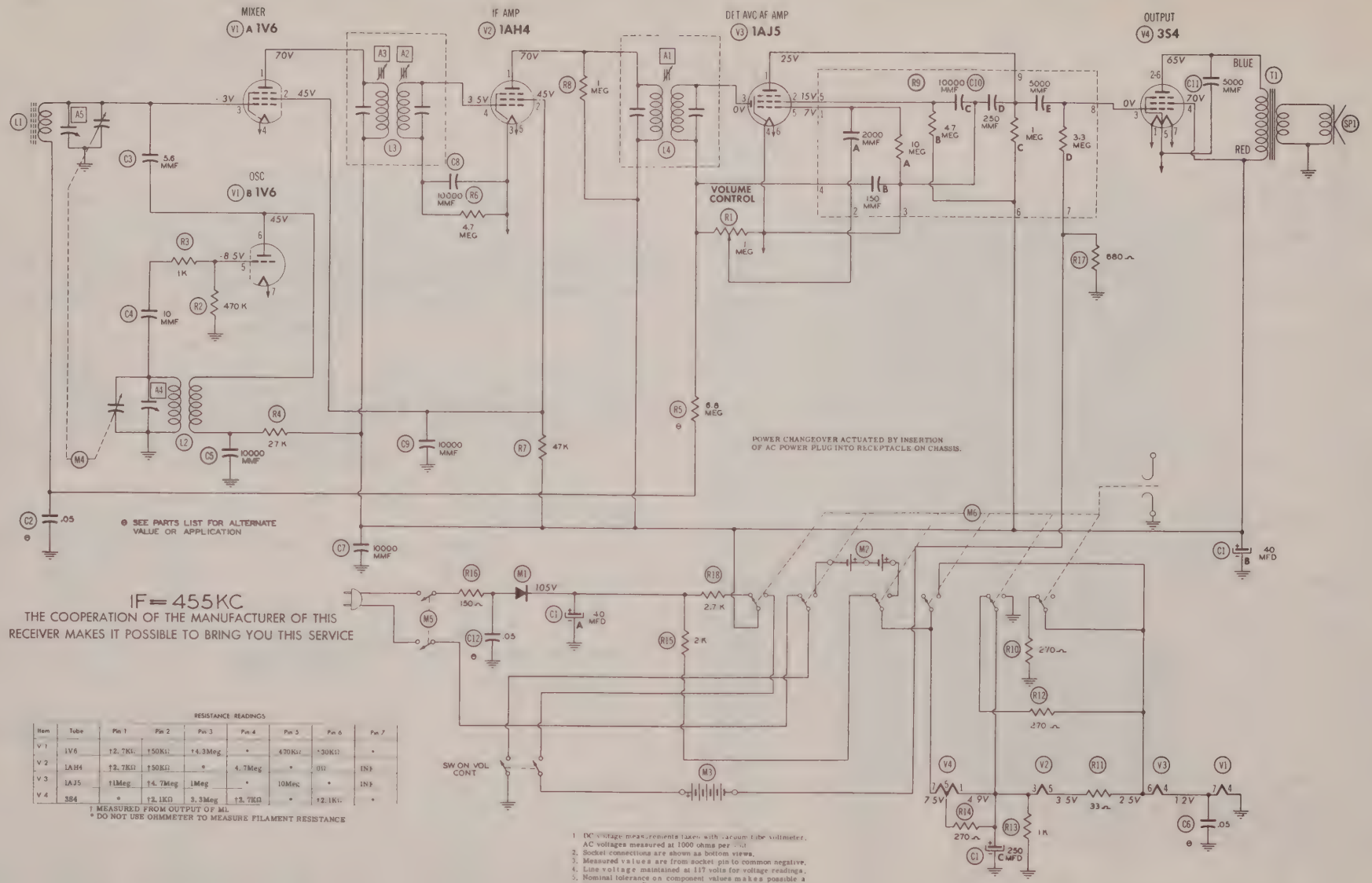

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	1V6	†2.7KΩ	†50KΩ	†4.3Meg	*	470KΩ	†30KΩ	*
V 2	1AH4	†2.7KΩ	†50KΩ	*	4.7Meg	*	0Ω	INF
V 3	1AJ5	†1Meg	†4.7Meg	1Meg	*	10Meg	*	INF
V 4	3S4	*	†2.1KΩ	3.3Meg	†3.7KΩ	*	†2.1KΩ	*

† MEASURED FROM OUTPUT OF M1.
* DO NOT USE OHMMETER TO MEASURE FILAMENT RESISTANCE

1. DC voltage measurements taken with Triplett Tube Voltmeter. AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

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PROPERTY OF
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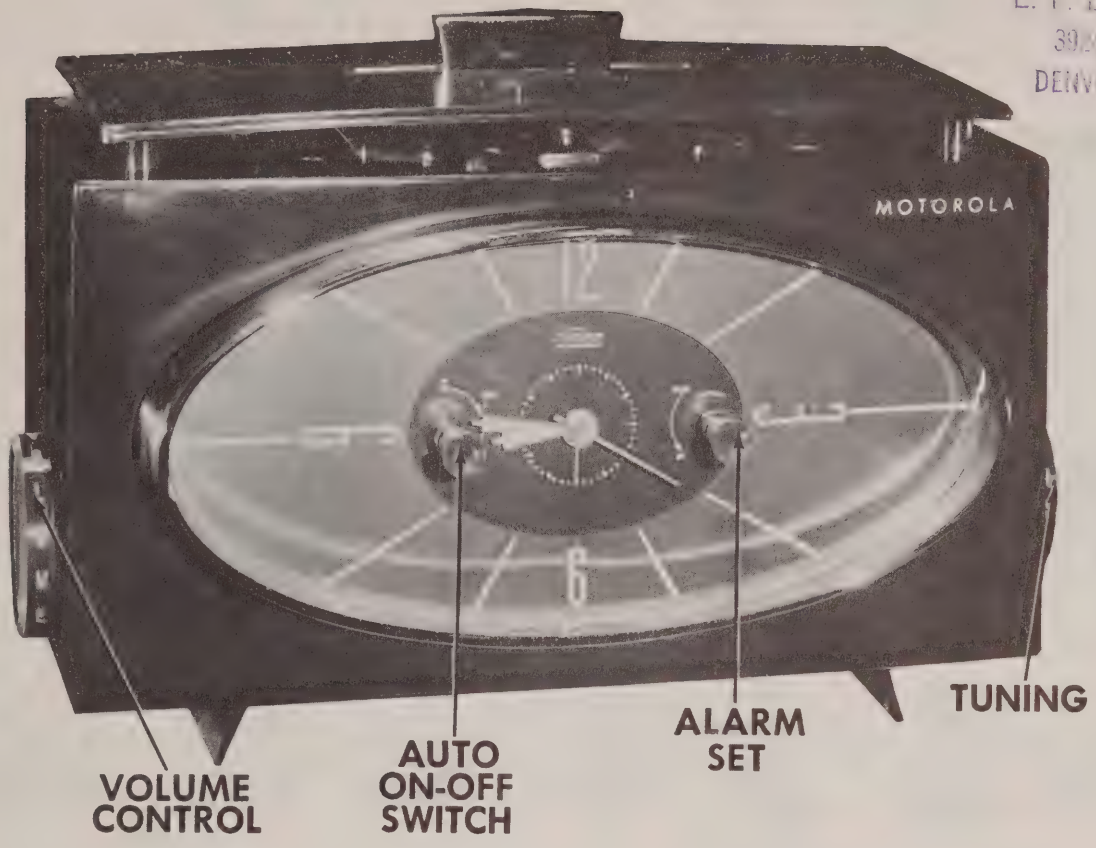
3924 MAPLE
DENVER, COLORADO

MOTOROLA MODELS
63C1, 63C2, 63C3 (Ch. HS-397)



MOTOROLA MODELS
63C1, 63C2, 63C3 (Ch. HS-397)

TRADE NAME	Motorola Models 63C1, 63C2, 63C3 (Ch. HS-397)
MANUFACTURER	Motorola, Inc., 4545 Augusta Blvd., Chicago 51, Ill.
TYPE SET	AC Operated AM Superheterodyne Receiver With Electric Clock
TUBES (Six)	Types 12BA6 RF Amp., 12BE6 Conv., 12BA6 IF Amp., 12AT6 Det.-AVC-AF Amp., 35C5 Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC-60 Cycles — RATING .25 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	535-1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (grid) of 12BE6 (V2). Low side to B-.	455KC (400~Mod)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.	"	"	1620KC	"	"	A5	"
3.		Loop	1400KC	Tune to 1400KC signal	"	A6, A7	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

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PARTS LIST AND DESCRIPTIONS

MOTOROLA
MODEL 63C1 (Ch. HS-397)

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		MOTOROLA PART No.	STANDARD REPLACEMENT		
V1	RF Amplifier	12BA6	12BA6	7BK	
V2	Converter	12BE6	12BE6	7CH	
V3	IF Amplifier	12BA6	12BA6	7BK	
V4	Det.-AVC-AF Amp.	12AT6	12AT6	7BT	
V5	Output	35C5	35C5	7CV	
V6	Rectifier	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	MOTOROLA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	40	150	23B484234	PRS150/40-20-20		BBRT422-IE		TCT-3114	TVA-3448	Red
B	20	150								Blue
C	20	150								Orange
C2	.05	200	8R121005	P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C3	.05	200	8R121005	P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C4	100		21R410036	S1100N750	TCN-100	N042	N750K-101	NT-531	5TCU-T1	
C5	5000		21R115312	BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C6A	2000				DD-202	K072	801-002	DC-522	5HK-D2	
B	220		21B482847	PA-100-1	D6-221	TP39	GP2L-221	UC-5322	5GA-T22	
C	5000				DD-502	K080	801-005	DC-525	5HK-D5	
C7	.02	400	8R121566	P488-02	DF-203	CUB4S2		PT412	4TM-S2	
C8	.047	400	8K490232	489ZX-047	DF-503	PJ4S47		PT4147	2TM-S47	
C9	.15	200	8K72686	P288-15		PJ2P15		PT4015	2TM-P15	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	MOTOROLA PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	1Meg	½	18K631259	Q13-137X	A47F-1Meg	BT-73	UT-438	Volume - tapped @ 300KΩ
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R1A

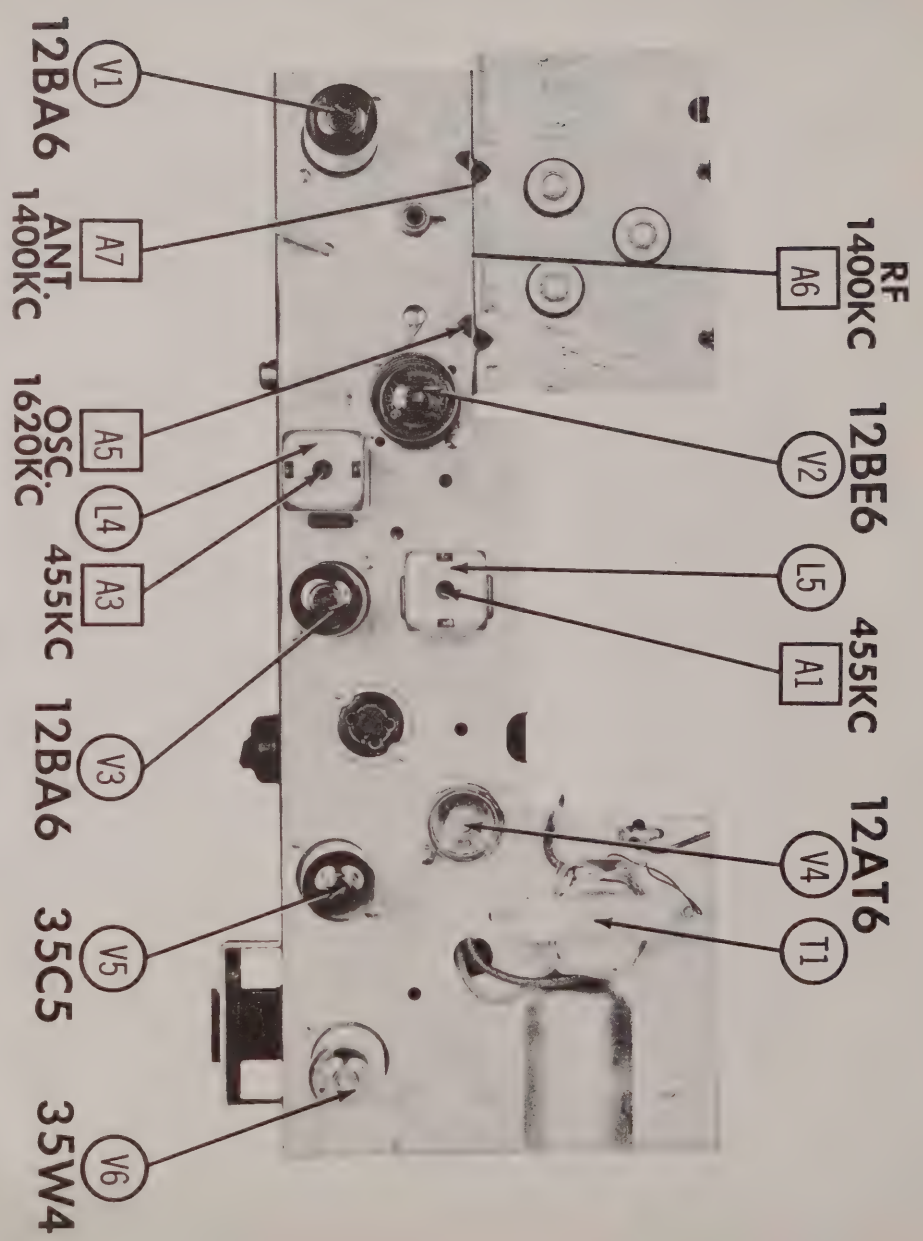
RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	MOTOROLA PART No.	IRC PART No.	
R2	150Ω	½	6R3992	BTS-150	Note 1
R3	500Ω	½	6R3949	BTS-500	
R4	22KΩ	½	6R6028	BTS-22K	
R5	100KΩ	½	6R6075	BTS-100K	
R6	150Ω	½	6R3992	BTS-150	
R7	47KΩ	½	6R6056	BTS-47K	
R8	2.2Meg	½	6R3927	BTS-2.2Meg	
R9	33KΩ	½	6R6012	BTS-33K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	MOTOROLA PART No.	IRC PART No.	
R10	10Meg	½	6R2109	BTS-10Meg	
R11	470KΩ	½	6R6032	BTS-470K	
R12	470KΩ	½	6R6032	BTS-470K	
R13	150Ω	½	6R3992	BTS-150	
R14	1000Ω	1	6R3953	BTA-1000	
R15	100Ω	1	6R488025	BTA-100	
R16	27Ω	½	6R5683	BTS-27	

Note 1. Some versions may use a 470Ω in this application.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	MOTOROLA PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	
T1	2.4KΩ	3.5Ω	25K631515	A-3332	A-3025	S-12X	Z1101	24S50 ①	① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	MOTOROLA PART No.	JENSEN PART No.	QUAM PART No.	
SP1	5 x 7"	PM	3.5Ω	50C631268			

COILS (RF-IF)

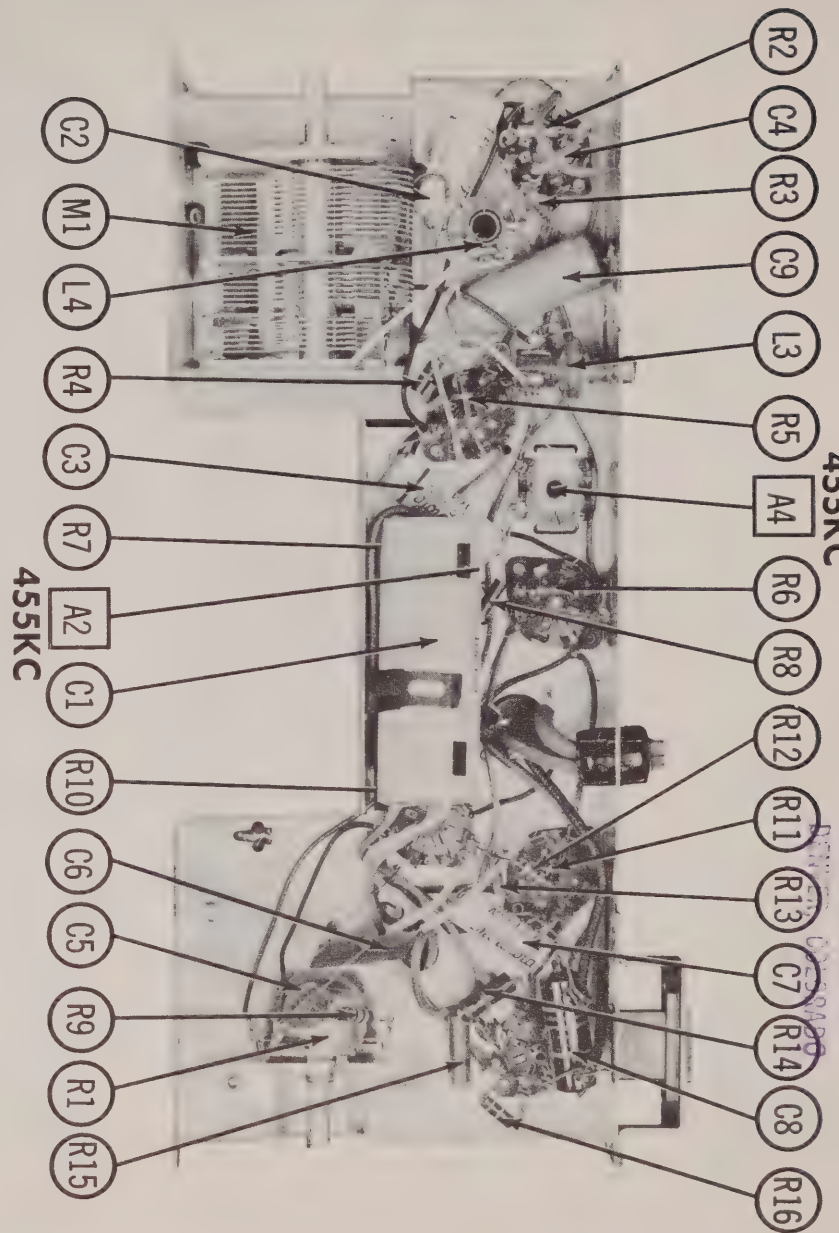
ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	MOTOROLA PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Loop Ant.	2.8Ω		24C631265				Includes cabinet back
L2	RF Coil	3.9Ω	9.5Ω*	24K631517				
L3	Osc. Coil	.9Ω	11.5Ω	24B631516			69-Osc.	
L4	Input IF	16Ω	16Ω	24C485553	16-6758	BC-352	12-C1	
L5	Output IF	17Ω	17Ω	24C485555	16-6770	BC-355	12-C6	

* Tapped ② .8Ω.

MISCELLANEOUS

ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M1	Tuning Cap.	19B631247	23-415MMF, 12-208MMF, 16-108MMF
M2	Clock Assy.	59K631267	
	Cabinet	16E631089	Less clock bezel, clock face & top cover - Model 63C1
	Cabinet	16K631091	Less clock bezel, clock face & top cover - Model 63C2
	Cabinet	16K631092	Less clock bezel, clock face & top cover - Model 63C3
	Cover	15K631095	Less handle - Model 63C1
	Cover	15K631096	Less handle - Model 63C2
	Cover	15K631097	Less handle - Model 63C3
	Crystal	61C631088	Clock face cover
	Handle	55A631263	
	Knob	36C631248	Tuning - Model 63C1
	Knob	36K631249	Tuning - Model 63C2
	Knob	36K631250	Tuning - Model 63C3
	Knob	36K631252	Volume - Model 63C1
	Knob	36K631253	Volume - Model 63C2
	Knob	36K631254	Volume - Model 63C3

CHASSIS—BOTTOM VIEW



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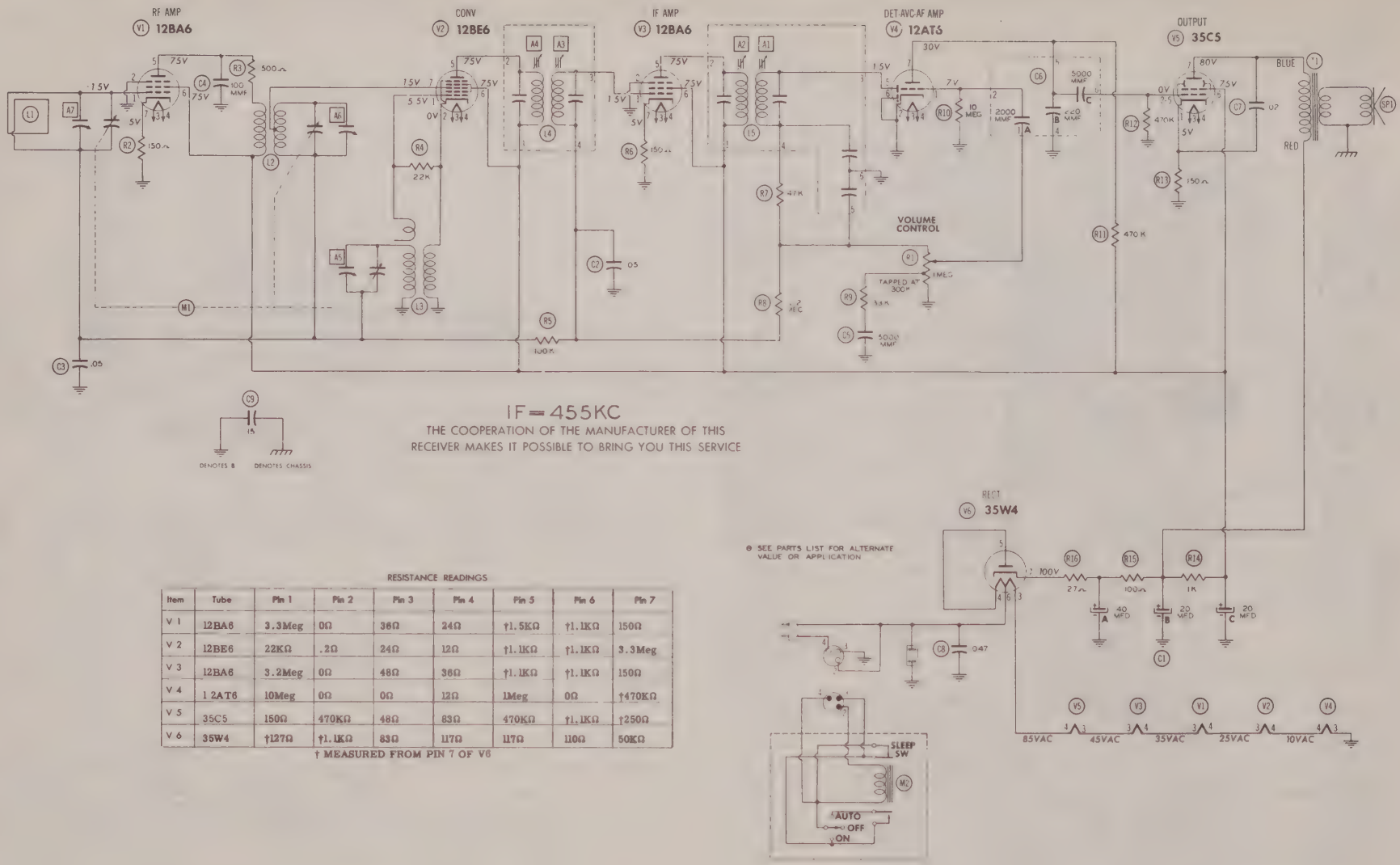

IF = 455KC

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12BA6	3.3Meg	0Ω	36Ω	24Ω	†1.5KΩ	†1.1KΩ	150Ω
V 2	12BE6	22KΩ	.2Ω	24Ω	12Ω	†1.1KΩ	†1.1KΩ	3.3Meg
V 3	12BA6	3.2Meg	0Ω	48Ω	36Ω	†1.1KΩ	†1.1KΩ	150Ω
V 4	12AT6	10Meg	0Ω	0Ω	12Ω	1Meg	0Ω	†470KΩ
V 5	35C5	150Ω	470KΩ	48Ω	83Ω	470KΩ	†1.1KΩ	†250Ω
V 6	35W4	†127Ω	†1.1KΩ	83Ω	117Ω	117Ω	110Ω	50KΩ

† MEASURED FROM PIN 7 OF V6

1. DC voltage measurements taken with vacuum tube voltmeter. AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

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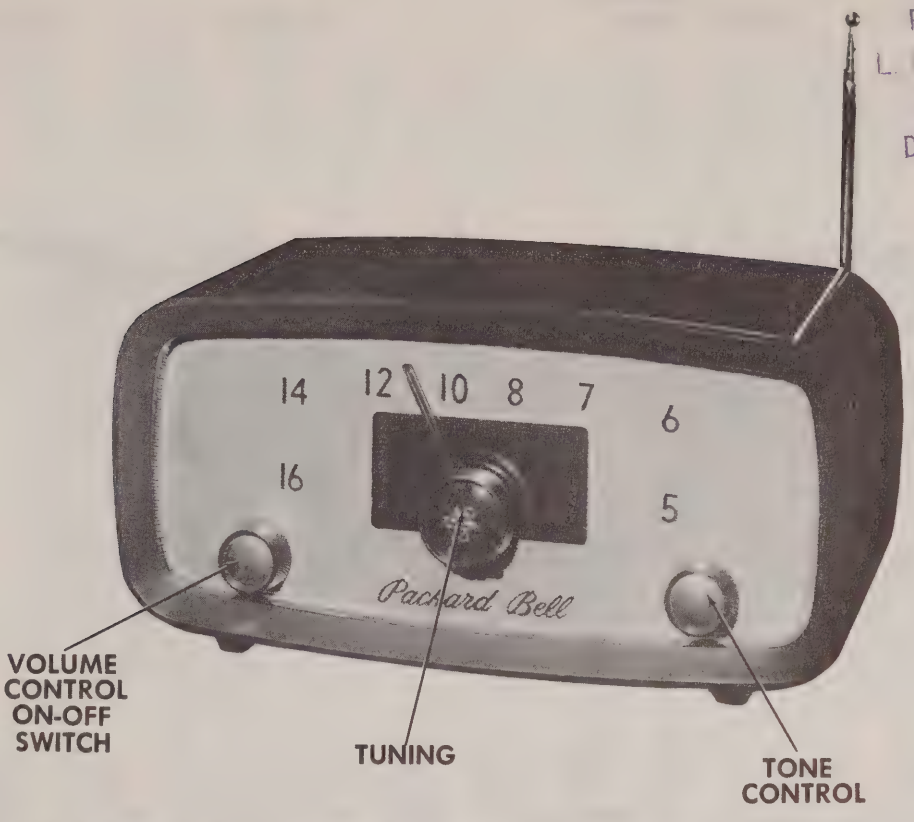
PACKARD-BELL
MODEL 632



PACKARD-BELL
MODEL 632

TRADE NAME Packard-Bell Model 632
MANUFACTURER Packard-Bell Co., Service Div., 11th. & Hope Sts., Los Angeles 15, California
TYPE SET AC-DC Operated 2 Band AM Superheterodyne Receiver
TUBES (Six) Types 6BJ6 RF Amp., 12BE6 Conv., 6BJ6 IF Amp., 12AV6 Det.-AVC-AF Amp., 50C5 Output, 35W4 Rectifier

POWER SUPPLY 110-120 Volts AC-DC RATING .22 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST 540KC-1620KC SHORT WAVE 1.7MC-5.6MC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
To set pointer, turn tuning capacitor fully closed and set pointer parallel with base of dial.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.01MFD	High side to pin 7 (grid) of 12BE6 (V2). Low side to B-.	455KC (400∿Mod)	BC	Tuning gang fully closed	Across voice coil	A1, A2, A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.	"	High side to SW antenna clip. Low side to B-.	5.6MC	SW	Tuning gang fully closed	"	A5	Adjust for maximum output.
3.	"	"	5.0MC	"	Tune to 5.0MC signal	"	A6, A7	"
4.	"	High side to BC antenna clip. Low side to B-.	1620KC	BC	Tuning gang fully open	"	A8	"
5.	"	"	1500KC	"	Tune to 1500KC signal	"	A9, A10	"
6.	"	"	600KC	"	Tune to 600KC signal	"	A11	Adjust for maximum output while rocking tuning gang thru 600KC.

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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PARTS LIST AND DESCRIPTIONS

PACKARD-BELL MODEL 632

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA: Packard-Bell PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RETMA BASE TYPE	NOTES
V1	RF Amplifier	6BJ6	6BJ6	7CM	
V2	Converter	12BE6	12BE6	7CH	
V3	IF Amplifier	6BJ6	6BJ6	7CM	
V4	Det.-AVC-AF Amp.	12AV6	12AV6	7BT	
V5	Output	50C5	50C5	7CD	
V6	Rectifier	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: Packard-Bell PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	50	150	24073	PRS150/50-		BBRD-5315		TCD-49	TVA-2453	Red
B	50	150		50						Yellow
C2	.047	200	23017	P288-047	DF-503	PJ2S47		PT4147	2TM-S47	
C3	5000		23931	BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C4	47		23912	SI47	D6-470	TP29	GP1K-470	UC-5447	5GA-Q47	
C5	100		23914	SI100	D6-101	TP34	GP1K-101	UC-531	5GA-T1	
C6	47		23912	SI47NP0	TCZ-47	TZ22	NP0K-470		5TCC-Q47	
C7	1250		23224							Note 1
C8	100									
C9A	100		♦23930	♦PA-97-1	♦PC-50	♦111TM1	♦1403-01	UC-531	♦D-1	
B	100							UC-531		
C10	220		23915	SI220	D6-221	TP39	GP2K-221	UC-5322	5GA-T22	
C11	.047	200	23017	P288-047	DF-503	PJ2S47		PT4147	2TM-S47	
C12	10000		23939	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C13	5000		23931	BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C14	2000		23974	BPD-002	DD-202	K072	801-002	DC-522	5HK-D2	Note 2
C15	10000		23939	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C16	10000		23939	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C17	.05	200	23017	289ZX-05	DF-503	PJ2S5		PT415	2TM-S5	
C18	.15	200	23028	P288-15		PJ2P15		PT4015	2TM-P15	

Note 1. Not used in all versions.
Note 2. In later productions, a 2000MMF disc capacitor is used.
♦ Items C9A, C9B and R9 are combined in one unit.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: Packard-Bell PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500KΩ	½	25514X	Q11-133	A47-500K-S	AB-40	U-41	Tone
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R1A
R2A	500KΩ	½	25029X	Q13-133X		ABT-66		Volume
B	Shaft		Not Req.	Not Req.		AK-4		Attach to R2A
C	Switch		Not Req.	76-1		KB-1		Attach to R2A

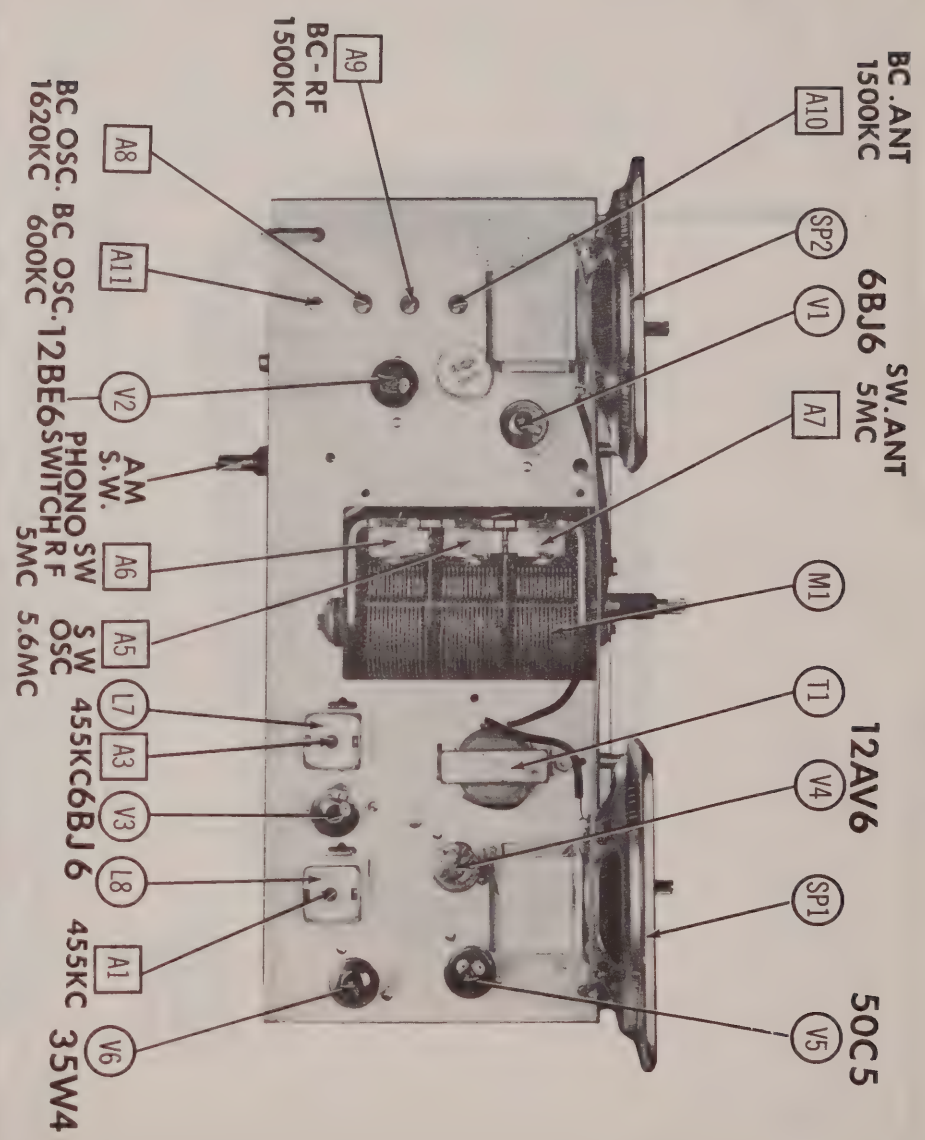
RESISTORS

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: Packard-Bell PART No.	REPLACEMENT DATA: IRC PART No.	NOTES
R3	220Ω	½	73017	BTS-220	
R4	4700Ω	½	73033	BTS-4700	
R5	1Meg	½	73161	BTS-1Meg	
R6	22KΩ	½	73041	BTS-22K	
R7	220Ω	½	73017	BTS-220	
R8	2.2Meg	½	73165	BTS-2.2Meg	
R9	47KΩ	½	♦23930	BTS-47K	

♦ Items R9, C9A, C9B are combined in one unit.

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: Packard-Bell PART No.	REPLACEMENT DATA: IRC PART No.	NOTES
R10	33KΩ	½	73043	BTS-33K	
R11	4.7Meg	½	73169	BTS-4.7Meg	
R12	470KΩ	½	73157	BTS-470K	
R13	470KΩ	½	73157	BTS-470K	
R14	150Ω	½	73015	BTS-150	
R15	1000Ω	1	73225	BTA-1000	
R16	68Ω	½	73011	BTS-78	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	Packard-Bell PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	
T1	2.3KΩ	6.4Ω	89445	A-3849 ①	A-2902 ①	S-12X	Z1101	22S88 ①	① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	Packard-Bell PART No.	JENSEN PART No.	QUAM PART No.	
SP1	4"	PM	3.2Ω	83013	ST-113 Mod. P4-X	4A1	
SP2	4"	PM	3.2Ω	83013	ST-113 Mod. P4-X	4A1	

COILS (RF-IF)

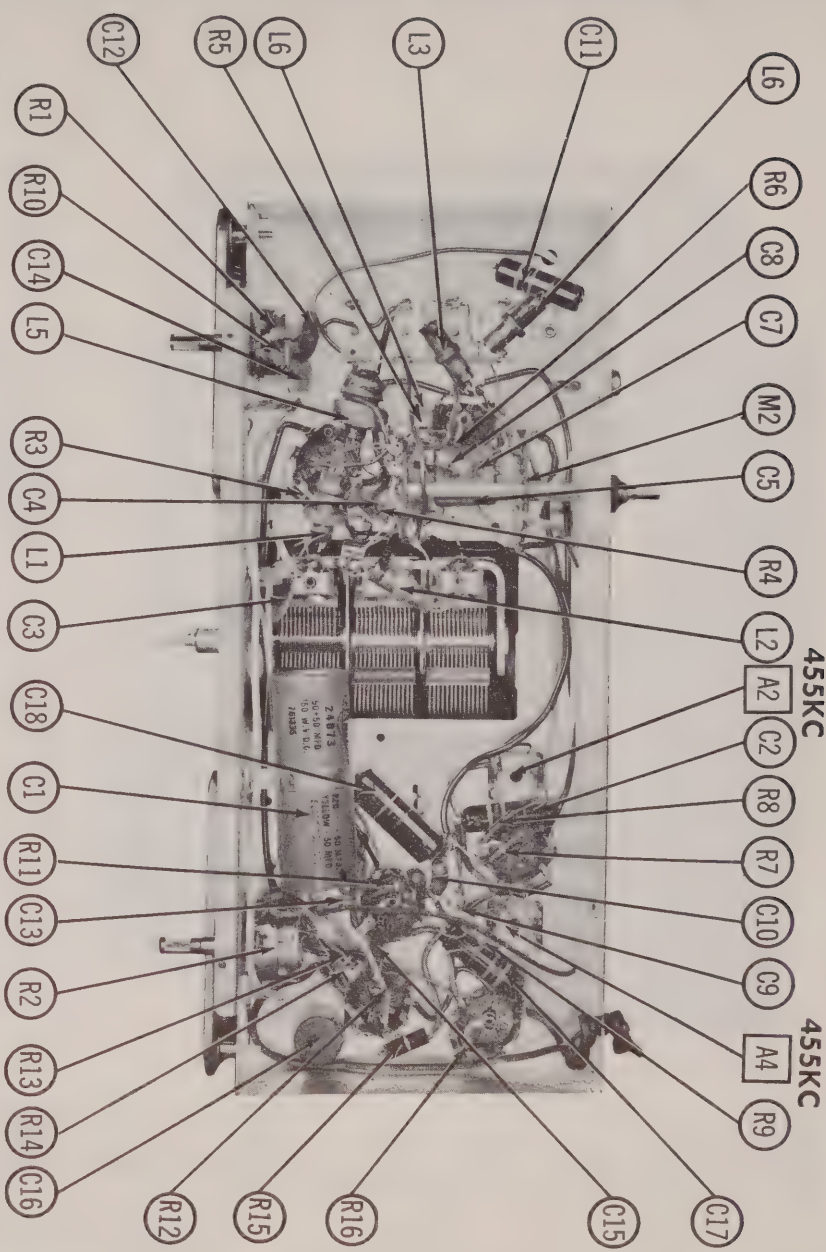
ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	Packard-Bell PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	SW Ant. Coil	12Ω	1.8Ω	29417	14-1071 *	BC-390 *	70-A *	
L2	SW RF Coil	.6Ω	1.8Ω	29120	14-1072	BC-391	70-RF *	
L3	SW Osc. Coil	1.6Ω		29223	14-1043 ■			Tapped @ .3Ω
L4	BC Loop Ant.	2.3Ω		29346				
L5	BC RF Coil	46Ω	10.5Ω	29121				
L6	BC Osc. Coil	4.2Ω		29222				Tapped @ .5Ω
L7	Input IF	18Ω	18Ω	29066	16-6758	BC-352	12-C1	
L8	Output IF	15Ω	15Ω	29067	16-6758	BC-353	12-C2	

* Leads sufficient mounting support.
■ Drill mounting hole.

MISCELLANEOUS

ITEM No.	PART NAME	Packard-Bell PART No.	NOTES
M1	Tuning Cap.	23533	21-465MMF, 21-465MMF, 21-465MMF
M2	Switch	86035	Function switch (Shortwave-Broadcast-Phono)
	Trimmer	23421	4 Sections (Ant. - BC-RF - BC Osc.
	Cabinet	632	Specify color
	Knob	52092A1	Tuning - Ivory
	Knob	52092AB	Tuning-brown
	Knob	52093AL	Volume or tone - Ivory
	Knob	52093AB	Volume or tone - brown
	Knob	52091AL	Tuning - Pointer - Ivory
	Knob	52091AB	Tuning - Pointer - Brown
	Knob	52080AL	Switch - Ivory
	Knob	520802AB	Switch - Brown
	Dial	38136	Broadcast
	Dial	38138	Shortwave

CHASSIS—BOTTOM VIEW



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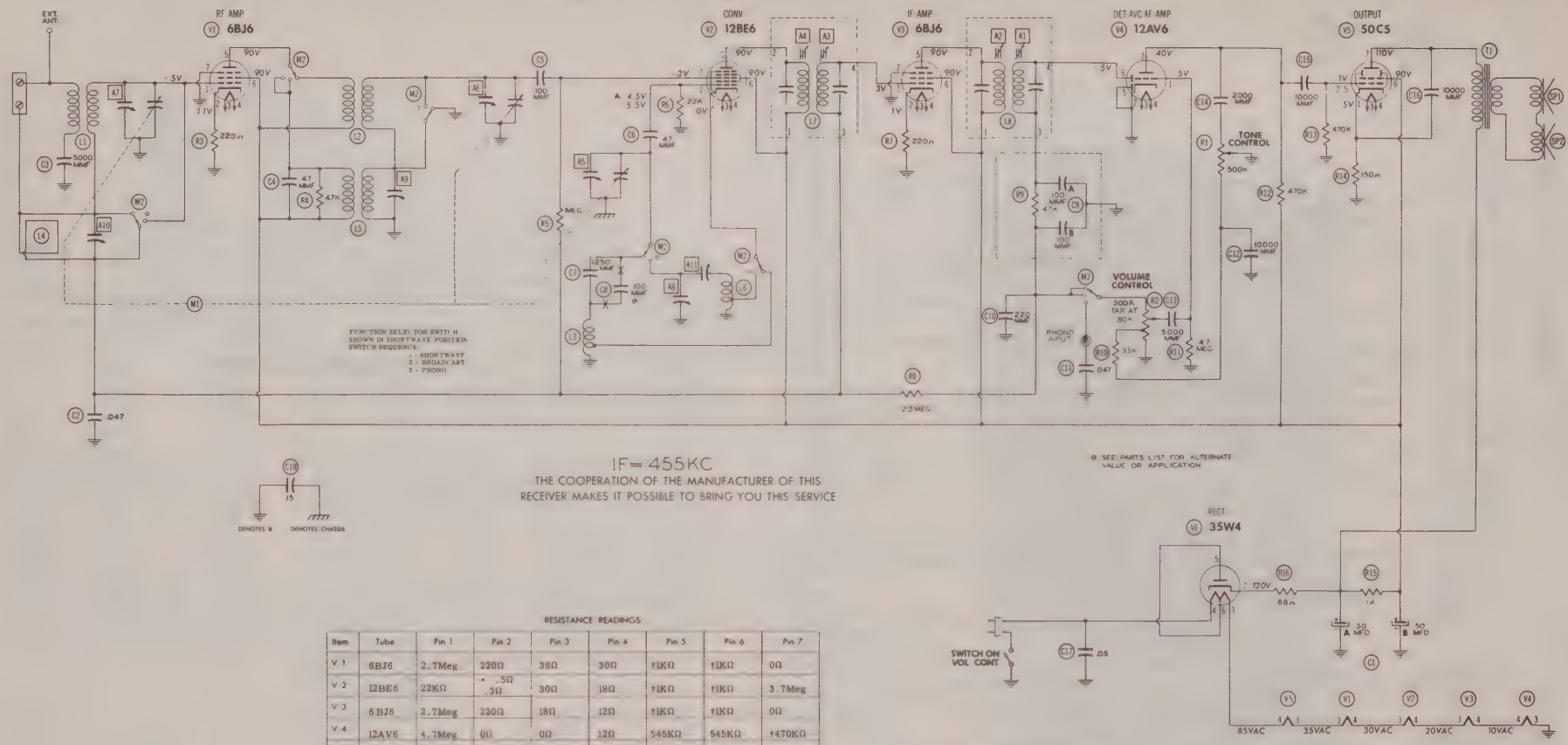
PACKARD-BELL MODEL 632

PACKARD-BELL MODEL 632

SET 266 FOLDER 11



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	6BJ6	2.7Meg	220Ω	36Ω	30Ω	†1KΩ	†1KΩ	0Ω
V 2	12BE6	22KΩ	▲ .5Ω .3Ω	30Ω	18Ω	†1KΩ	†1KΩ	3.7Meg
V 3	6BJ6	2.7Meg	220Ω	18Ω	12Ω	†1KΩ	†1KΩ	0Ω
V 4	12AV6	4.7Meg	0Ω	0Ω	12Ω	545KΩ	545KΩ	†470KΩ
V 5	50C5	150Ω	470KΩ	36Ω	86Ω	470KΩ	†1KΩ	†270Ω
V 6	35W4	168Ω	INF	86Ω	121Ω	115Ω	115Ω	40KΩ

ALL MEASUREMENTS TAKEN IN "SW" POSITION UNLESS OTHERWISE DESIGNATED.
† MEASURED FROM PIN 7 OF V6
▲ MEASURED IN "BC" POSITION

1. DC voltage measurements taken with vacuum tube voltmeter. AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at rated value for voltage readings.
5. Nominal tolerance on equipment values of parts used is a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

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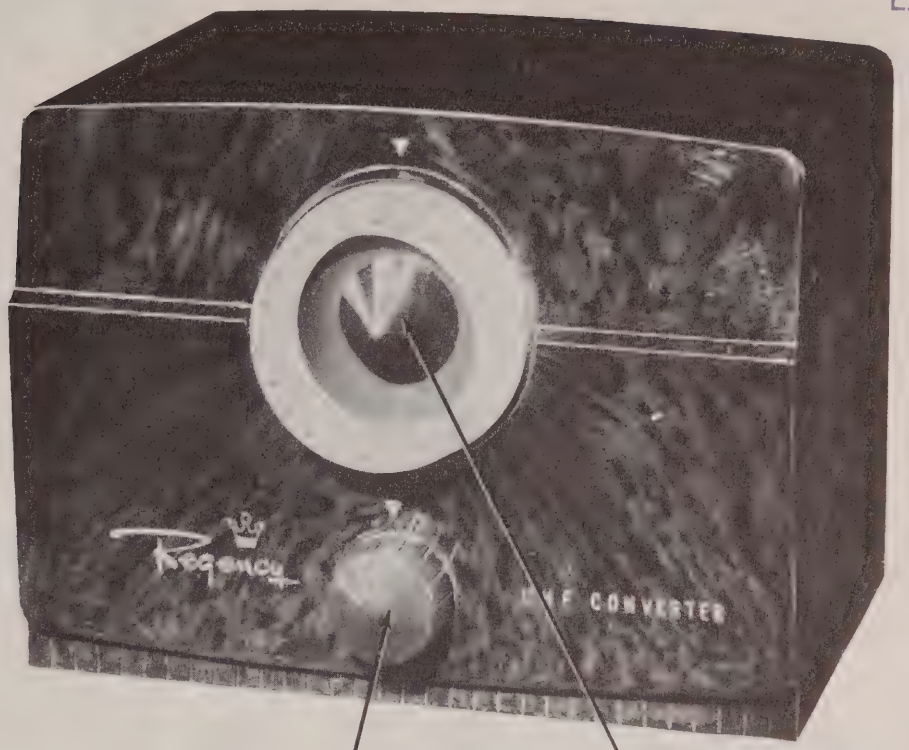
REGENCY
MODEL RC-53 (UHF Conv.)



UHF
VHF
OFF
SWITCH

TUNING

REGENCY
MODEL RC-53 (UHF Conv.)

TRADE NAME	Regency Model RC-53
MANUFACTURER	I. D. E. A. Inc., 7900 Pendleton Pike, Lawrence, Ind.
TYPE SET	AC Operated All Channel UHF Converter
TUBES (One)	Types 6AF4 Oscillator
POWER SUPPLY	110-120 Volts AC RATING .1 Amp. @ 117 Volts AC

THIS UNIT HAS BEEN PROPERLY ALIGNED AT THE FACTORY AND IS VERY STABLE. ALIGNMENT IN THE FIELD SHOULD NOT BE REQUIRED.

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PARTS LIST AND DESCRIPTIONS

REGENCY MODEL RC-53

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		REGENCY PART No.	STANDARD REPLACEMENT		
V1	UHF Osc.	6AF4	6AF4	7DK	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	REGENCY PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	■30	150		AFH2-11		B011		FP211	TVL-2422	
B	▲30	150								
C2	4.3									
C3	1.5			SI L 5NP0	TCZ-L 5	Z004	NP0A-1R5	ZT-5515	5TCCB-V15	
C4	4.3									
C5	.33									
C6	2000			BPD-002	DD-202	K072	801-002	DC-522	5HK-D2	Note 1

Note 1: Some versions use 1000MMF in this application.

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	REGENCY PART No.	IRC PART No.	
R1	10KΩ	½		BTS-10K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	REGENCY PART No.	IRC PART No.	
R2	2700Ω	1		BTA-2700	

TRANSFORMER (POWER)

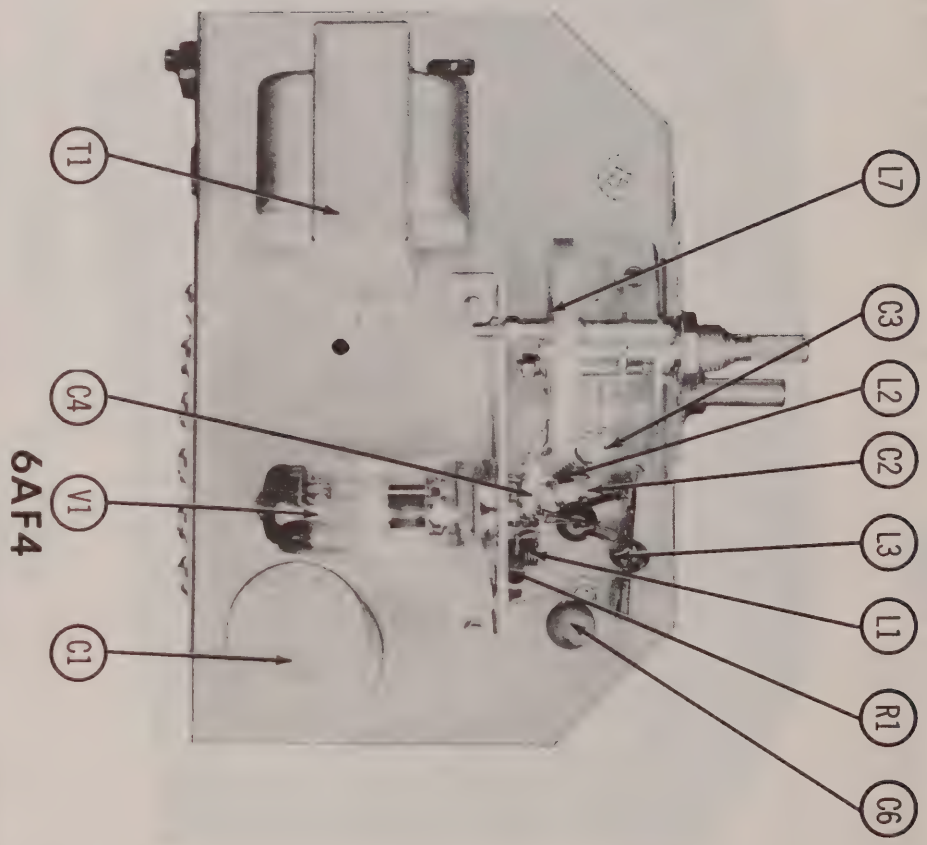
ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	REGENCY PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.
T1	117VAC @ .1A	125VAC @ .015A Tap @ 6.3VAC @ .23A			300-372	PS-8415 ①	P-3046 ①	R-54X ①②	P9100	26R32 ①

① Transformer has separate filament winding.
② Drill new mounting holes.

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	REGENCY PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	UHF Fil. Choke	0Ω						
L2	UHF Fil. Choke	0Ω						
L3	UHF RF Choke	0Ω						
L4	UHF Ant. Coil	0Ω						
L5	UHF Ant. Coil	0Ω						
L6	UHF RF Choke	0Ω						
L7	UHF Osc. Coil	0Ω						

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA						NOTES
	CURRENT	REGENCY PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	SARKES TARZIAN PART No.	SELETRON PART No.	
M1	.015		1159 ①	RC-38 ①	8S20	50	8Y1	① Add mounting lug for mounting rectifier.

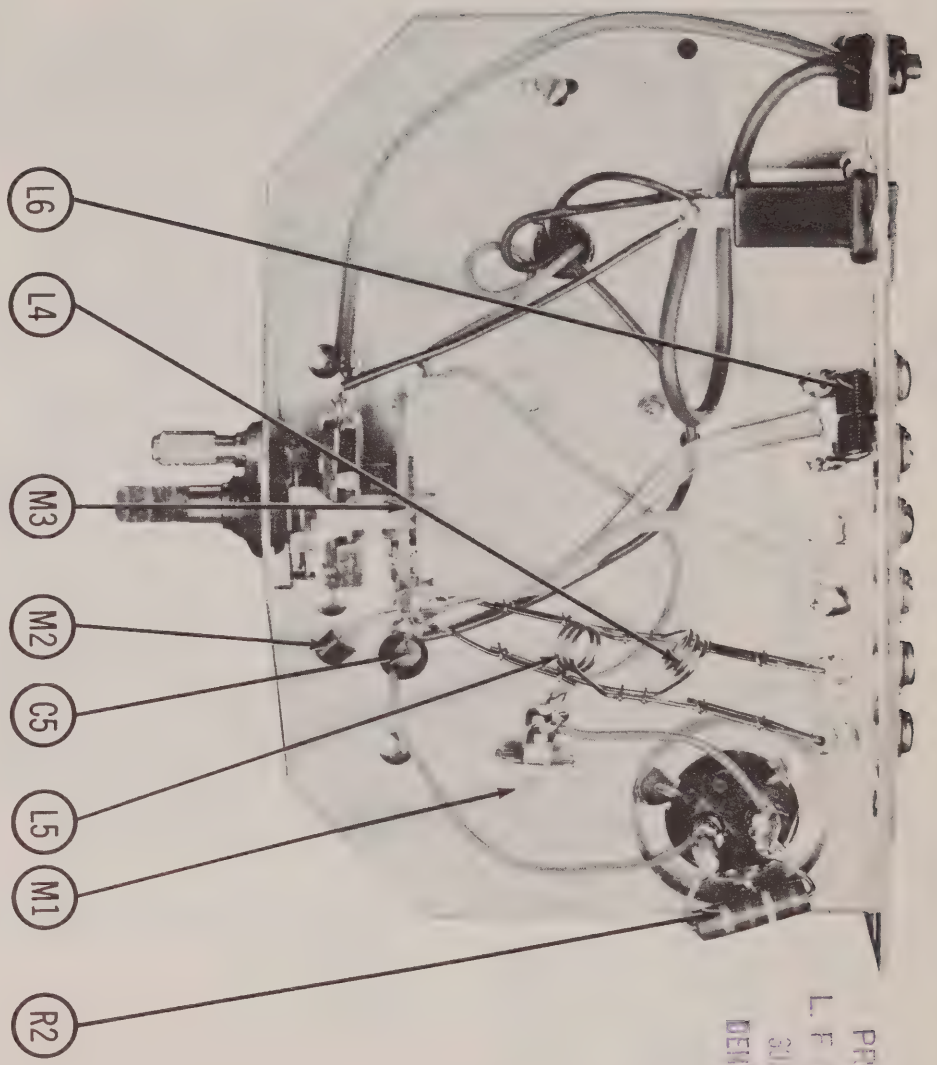
CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		REGENCY PART No.	FEDERAL PART No.	SYLVANIA PART No.	
M2	TS-3			1N82 or 1N82A	UHF Mixer

MISCELLANEOUS

ITEM No.	PART NAME	REGENCY PART No.	NOTES
M3	Switch		VHF-UHF

CHASSIS—BOTTOM VIEW



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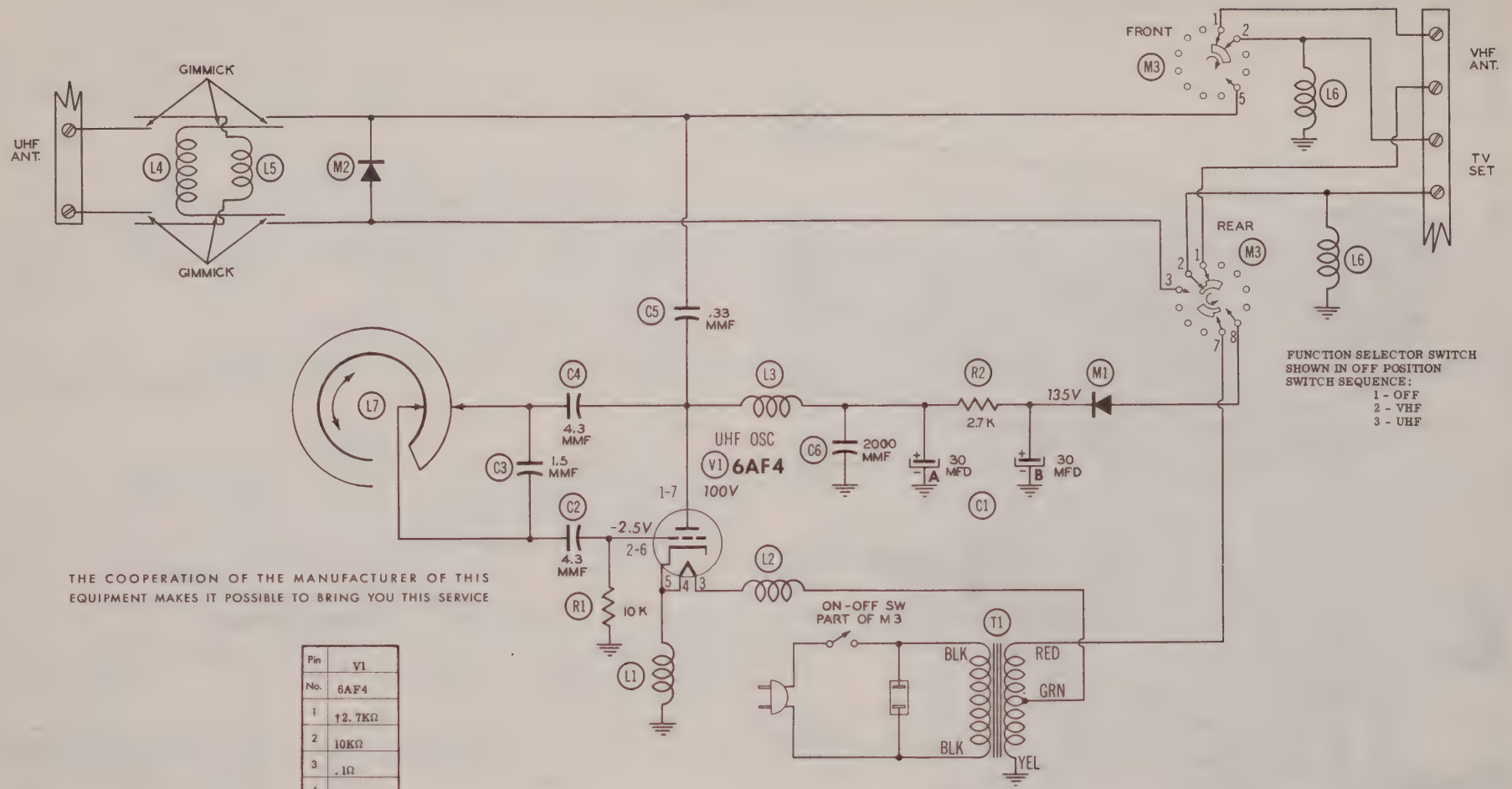

FUNCTION SELECTOR SWITCH SHOWN IN OFF POSITION
SWITCH SEQUENCE:
1 - OFF
2 - VHF
3 - UHF

THE COOPERATION OF THE MANUFACTURER OF THIS EQUIPMENT MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

Pin No.	V1 6AF4
1	†2.7KΩ
2	10KΩ
3	.1Ω
4	0Ω
5	0Ω
6	10KΩ
7	†2.7KΩ

† MEASURED FROM OUTPUT OF M1.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.

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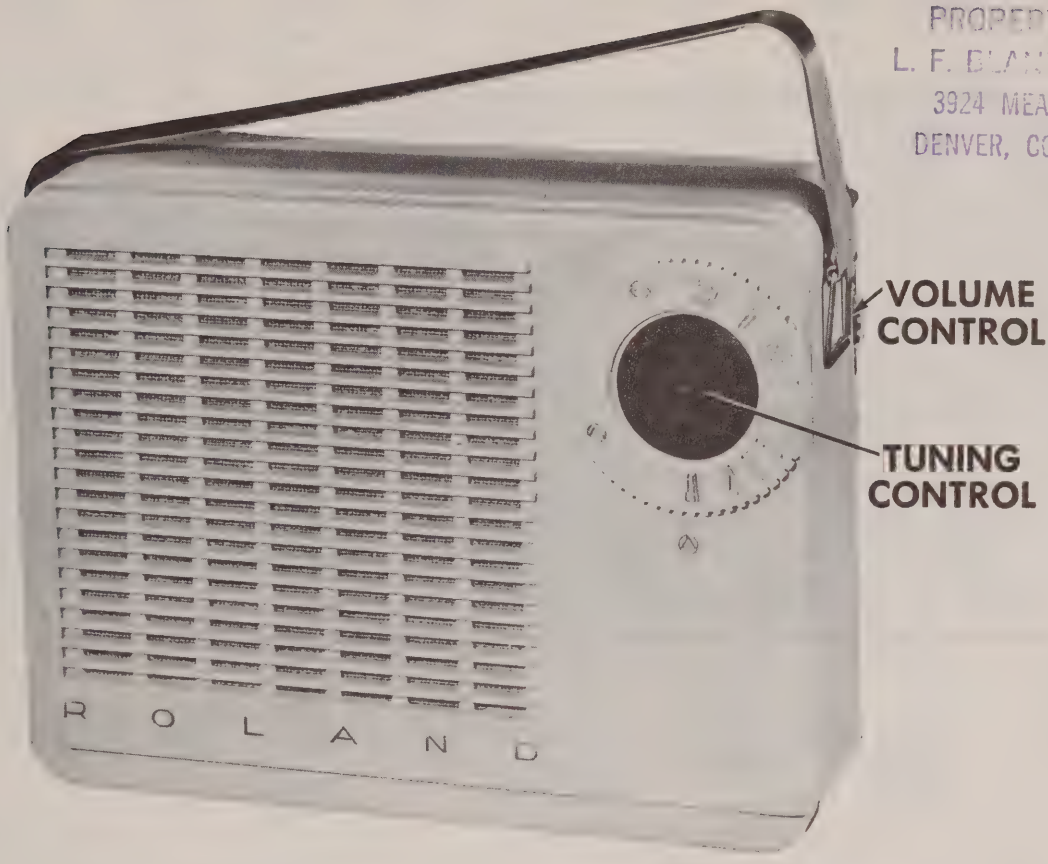
ROLAND
MODEL 4P2



ROLAND
MODEL 4P2

TRADE NAME	Roland Model 4P2
MANUFACTURER	Roland Radio Corp., 12-30 Anderson Ave., Mt. Vernon, N.Y.
TYPE SET	Battery Operated AM Superheterodyne Receiver
TUBES (Four)	Types 1R5 Conv., 1U4 IF Amp., 1U5 Det.-AVC-AF Amp., 3V4 Output
POWER SUPPLY	1.5 Volts "A" Supply & 67.5 Volts "B" Supply
RATING	250MA @ 1.5 Volts DC & 7.5 MA @ 67.5 Volts DC
TUNING RANGE—BROADCAST	535-1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.01MFD	High side to antenna stator lug on tuning gang. Low side to chassis.	455KC (400~Mod)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.	"	"	1620KC	"	"	A5	"
3.		Loop	1400KC	Tune to 1400KC signal	"	A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

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PARTS LIST AND DESCRIPTIONS

ROLAND MODEL 4P2

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		ROLAND PART No.	STANDARD REPLACEMENT		
V1	Converter	1R5	1R5	7AT	
V2	IF Amplifier	1U4	1U4	6AR	
V3	Det.-AVC-AF Amp.	1U5	1U5	6BW	
V4	Output	3V4	3V4	6BX	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	ROLAND PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1	10	70		PRS150/12		BR1015		TC42	TVA-1406	
C2	.05	200		P288-05	DF-503	PT2S5		PT415	2TM-S5	
C3	47			SI47	D6-470	TP29	GP1K-470	UC-5447	5GA-Q47	
C4	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C5	270			BPD-00027	D6-271	G054	GP2K-271	UC-5327	5GA-T27	
C6	2000			BPD-002	DD-202	K072	801-002	DC-532	5GA-D2	
C7	100									
C8	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C9	2000			BPD-002	DD-202	K072	801-002	DC-532	5GA-D2	
C10	2000			BPD-002	DD-202	K072	801-002	DC-532	5GA-D2	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	ROLAND PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1	1Meg	½						Volume

RESISTORS

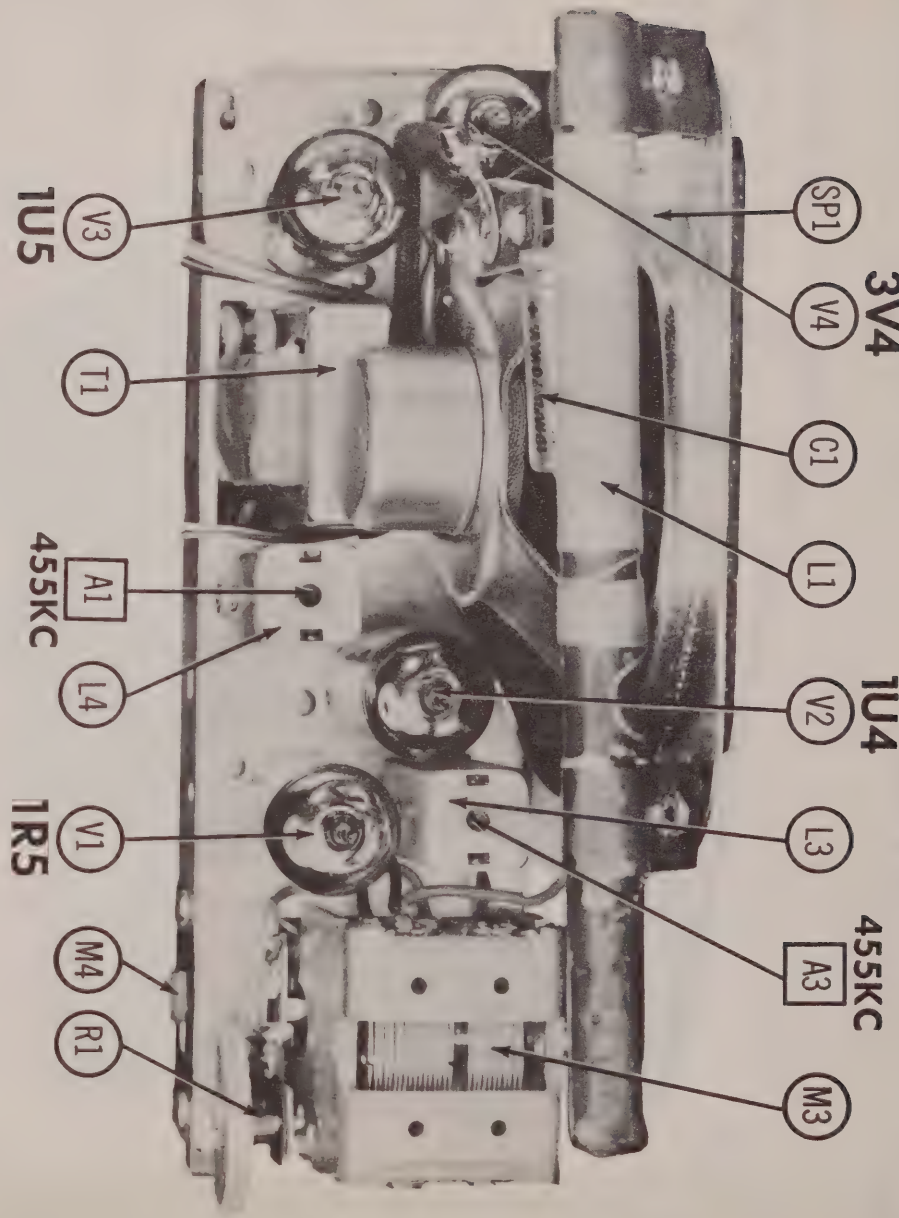
ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	ROLAND PART No.	IRC PART No.	
R2	100KΩ	½		BTS-100K	
R3	15KΩ	½		BTS-15K	
R4	2.2Meg	½		BTS-2.2Meg	
R5	10Meg	½		BTS-10Meg	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	ROLAND PART No.	IRC PART No.	
R6	4.7Meg	½		BTS-4.7Meg	
R7	1Meg	½		BTS-1Meg	
R8	1Meg	½		BTS-1Meg	
R9	390Ω	½		BTS-390	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	ROLAND PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	
T1	9.2KΩ	3.4Ω			A-2927 ①				① Bend mounting tabs down, file out slots, mount on original mounting bracket.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	ROLAND PART No.	VIKING PART No.	QUAM PART No.	
SP1	4"	PM	3.4Ω		4J6	4A1	

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	ROLAND PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Ant. Coil	.5Ω						
L2	Osc. Coil	.7Ω	4.6Ω		14-1074		70-Osc.	
L3	Input IF	13Ω	13Ω				10-C1	
L4	Output IF	13Ω	13Ω				10-C2	

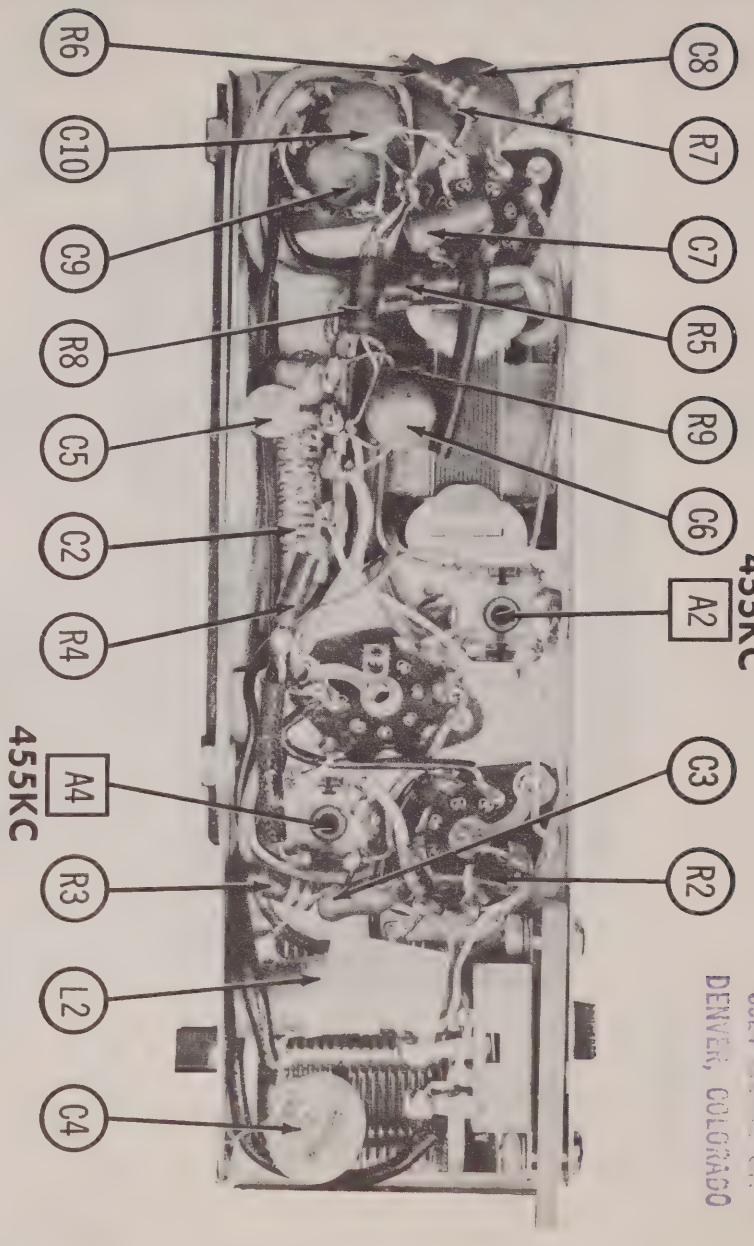
BATTERIES

ITEM No.	VOLTAGE	ROLAND PART No.	REPLACEMENT DATA						INSTALLATION NOTES
			EVEREADY			BURGESS			
			"A"	"B"	"A-B"	"A"	"B"	"A-B"	
M1	1.5V		635			#1			Connect 2 in parallel
M2	67.5V			477			P45		

MISCELLANEOUS

ITEM No.	PART NAME	ROLAND PART No.	NOTES
M3	Tuning Cap.	CV-64	11-178MMF, 16-103MMF
M4	Switch		On-off

CHASSIS—BOTTOM VIEW



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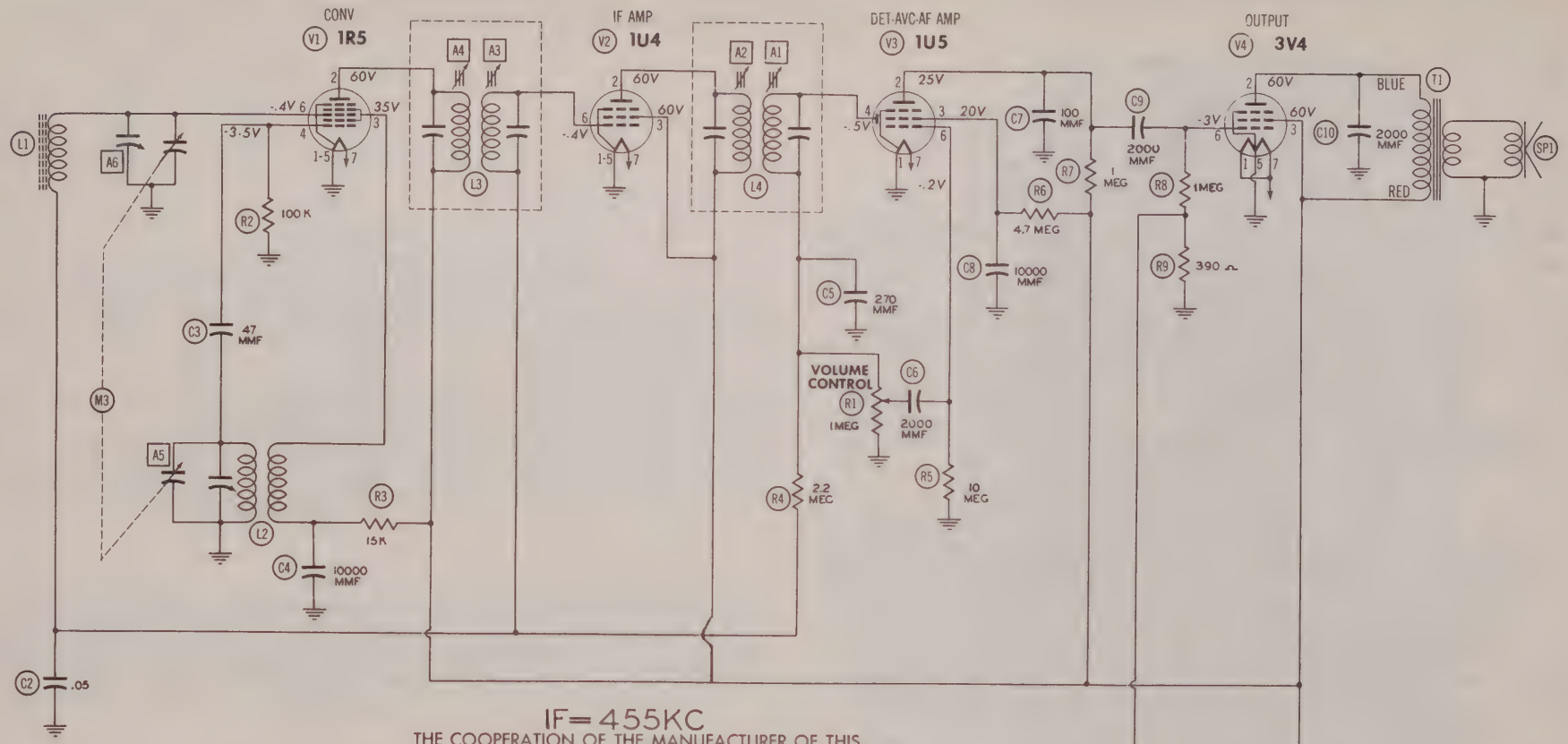
ROLAND MODEL 4P2



IF=455KC

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	1R5	*	†13Ω	†18KΩ	100KΩ	*	3.5Meg	*
V 2	1U4	*	†13Ω	†0Ω	INF	*	3.5Meg	*
V 3	1U5	*	†1Meg	†5.7Meg	1.2Meg	INF	10Meg	*
V 4	3V4	*	†348Ω	†0Ω	INF	*	1.3Meg	*

* DO NOT USE OHMMETER TO MEASURE FILAMENT RESISTANCE
† MEASURED FROM POSITIVE TERMINAL OF C1

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

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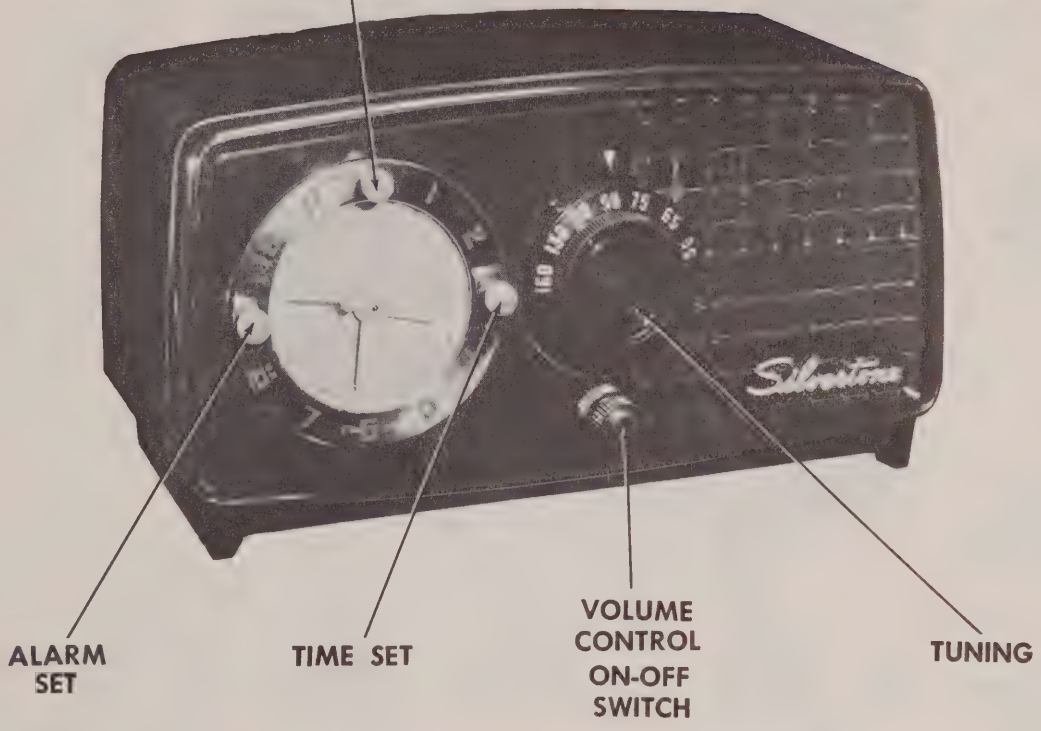
SILVERTONE MODELS
2018, 2019 (Ch. 757.100-1)



SILVERTONE MODELS
2018, 2019 (Ch. 757.100-1)

TRADE NAME	Silvertone Model 2018, 2019 (Ch. 757.100-1)
SUPPLIER	Sears Roebuck & Co., 925 S. Homan, Chicago, Ill.
TYPE SET	AC Operated AM Superheterodyne Receiver With Electric Clock
TUBES (Four)	Types 12BE6 Conv., 12AV6 Det-AVC-AF Amp., 50L6GT Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC-60 Cycles — RATING .26 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	535KC - 1640KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
To set pointer, turn tuning capacitor fully closed and set pointer parallel with base of dial.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
Remove antenna hank from antenna coil. Connect 50MMF capacitor where antenna hank was removed.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1	.05MFD	High side to antenna stator plate lug. Low side to chassis.	455KC (400~ Mod.)	Tuning gang fully open.	Across voice coil.	A1, A2	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2	"	"	1640KC	"	"	A3	"
3	50MMFD	"	1400KC	Tune to 1400KC signal.	"	A4	Adjust for maximum output. Check 600KC and 100KC. If necessary repeat steps 1 and 2.

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		SILVERTONE PART No.	STANDARD REPLACEMENT		
V1	Converter	12BE6	12BE6	7CH	
V2	Det.-AVC-AF Amp.	12AV6	12AV6	7BT	
V3	Output	50L6GT	50L6GT	7AC	
V4	Rectifier	35W4	35W4	6BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	SILVERTONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	60	150	E324	PRS150/50-30-20		BBRT531-5C		TCT3107	TVA-3430	Red
B	30	150								Blue
C	20	150								Yellow
C2	12			SI12	D6-120	TP10	GP1K-120	UC-5412	5GA-Q12	
C3	.05	400	E306	P488-05	DF-503	CUB4S5		PT415	4TM-S5	
C4	100		E331	SI100	D6-101	TP34	GP1K-101	UC-531	5GA-T1	
C5	.002	600	E3013	P688-002	D6-202	CUB6D2	GP2-333-202	PT622	6TM-D2	
C6	220			SI220	D6-221	TP39	GP2K-221	UC-5322	5GA-T22	Note 1
C7	.01	600	E301	P688-01	D6-103	CUB6S1	GP2-333-103	PT611	6TM-S1	
C8	.01	600	E301	P688-01	D6-103	CUB6S1	GP2-333-103	PT611	6TM-S1	
C9	.047	400	E342	P488-047	DF-503	CUB4S47		PT4147	4TM-S47	
C10	.05	400	E306	P488-05	DF-503	CUB4S5		PT415	4TM-S5	

Note 1. Some versions use 270MMF in this application.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	SILVERTONE PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	2Meg	½	E252	Q13-139	A47-2Meg-Z	AB-76	U-55	Volume
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R1A
C	Switch		Not Req.	76-1	SWE-12	KB-1	US-26	Attach to R1A

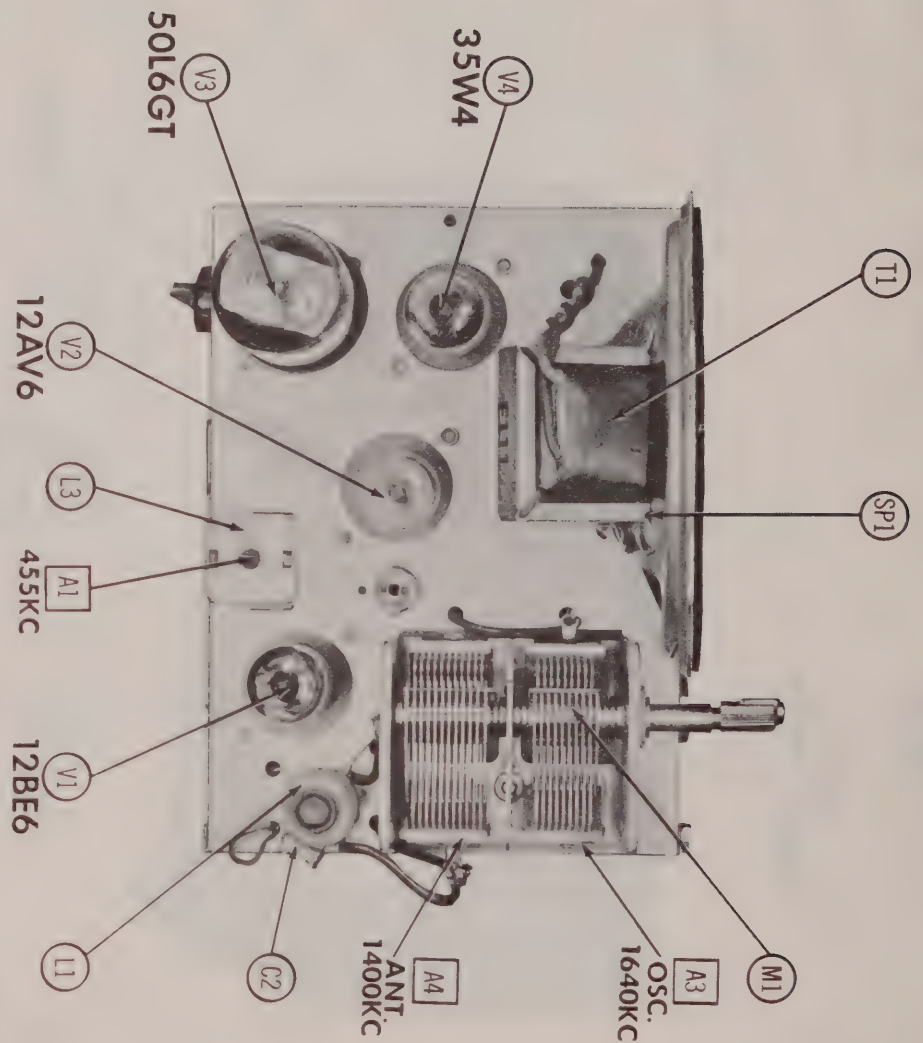
RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	SILVERTONE PART No.	IRC PART No.	
R2	820Ω	½		BTS-820	
R3	22KΩ	½		BTS-22K	
R4	3.3Meg	½		BTS-3.3Meg	
R5	15Meg	½		BTS-15Meg	Note 1
R6	470KΩ	½		BTS-470K	

Note 1. Some versions may use a 10Meg in this application.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	SILVERTONE PART No.	IRC PART No.	
R7	470KΩ	½		BTS-470K	
R8	120Ω	½		BTS-120	
R9	2200Ω	1		BTA-2200	
R10	42Ω	2			
R11	22Ω	½		BTS-22	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	SILVERTONE PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	
T1	2.2KΩ	3.5Ω	Part of Spkr.	A-3332	A-3025	S-12X	Z1101	26S58 ①	① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	SILVERTONE PART No.	JENSEN PART No.	QUAM PART No.	
SP1	4"	PM	3.5Ω	E103	ST-113 Mod. P4-X	4A07	

COILS (RF-IF)

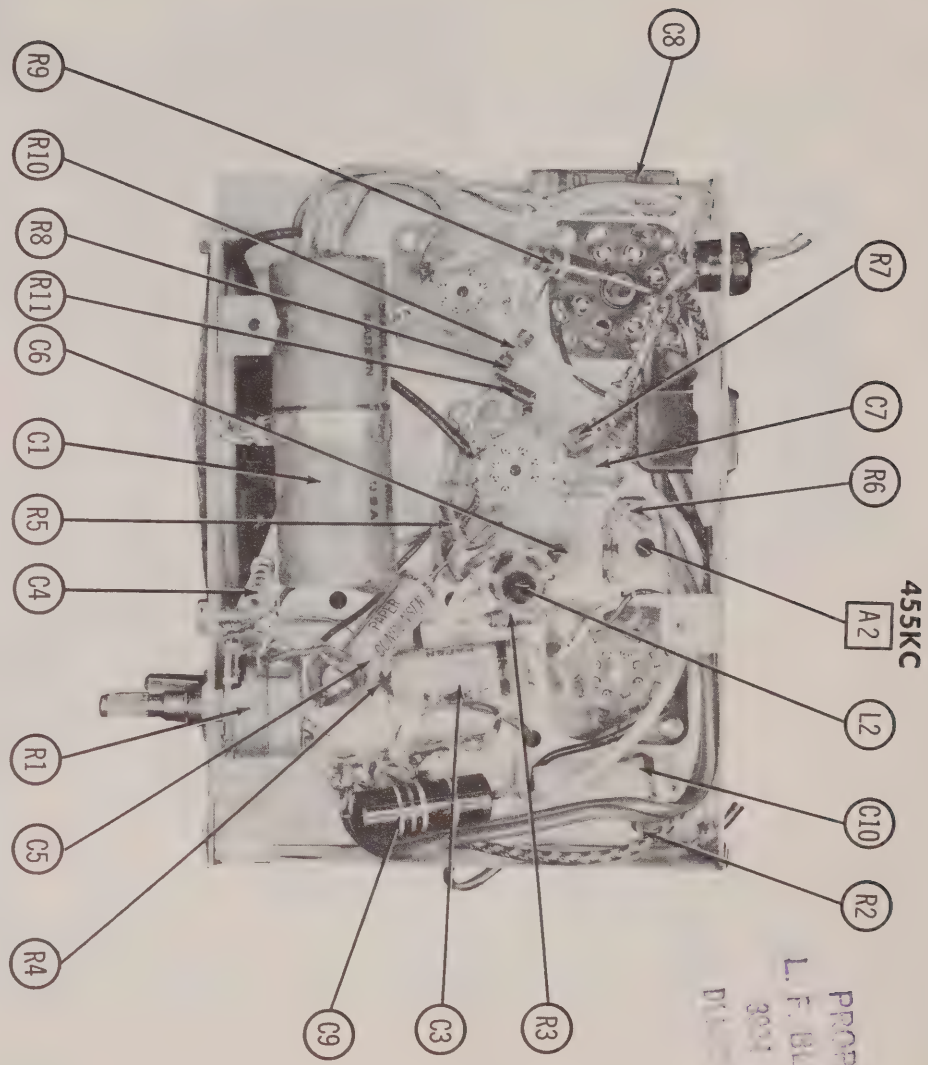
ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	SILVERTONE PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Ant. Coil	90Ω	2.8Ω	E615	14-1026	BC-380	72-A	
L2	Osc. Coil	.5Ω	5.5Ω	E614	14-1073 *		69-Osc. ■	
L3	IF Trans.	20Ω ▲	20Ω	E623				

* Leads sufficient mounting support.
■ Drill new mounting hole.
▲ Tapped @ 2.5Ω

MISCELLANEOUS

ITEM No.	PART NAME	SILVERTONE PART No.	NOTES
M1	Tuning Cap.	E352	24-378MMF, 28-198MMF
	Cabinet	Eu01	Brown
	Knob	E503	Tuning
	Knob	E504	On-off-volume

CHASSIS—BOTTOM VIEW



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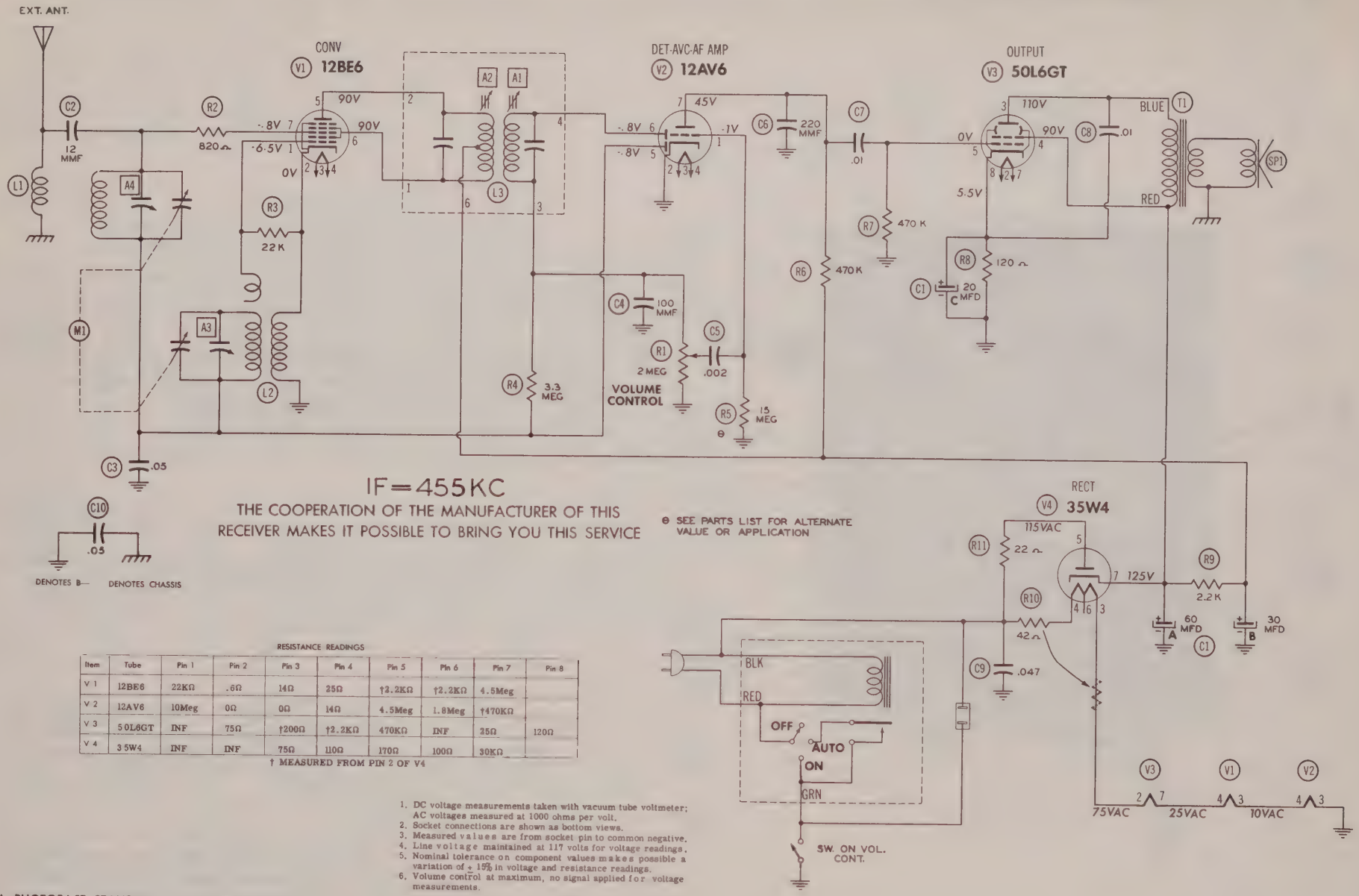
SILVERTONE
MODEL 2018 (Ch. 757.100-1)



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	12BE6	22KΩ	.6Ω	14Ω	25Ω	†2.2KΩ	†2.2KΩ	4.5Meg	
V 2	12AV6	10Meg	0Ω	0Ω	14Ω	4.5Meg	1.8Meg	†470KΩ	
V 3	50L6GT	INF	75Ω	†200Ω	†2.2KΩ	470KΩ	INF	25Ω	120Ω
V 4	35W4	INF	INF	75Ω	110Ω	170Ω	100Ω	30KΩ	

† MEASURED FROM PIN 2 OF V4

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

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SILVERTONE
MODEL 4035 (Ch. 528.305)

SILVERTONE
MODEL 4035 (Ch. 528.305)

TRADE NAME	Silvertone Model 4035 (Ch. 528.305)
SUPPLIER	Sears Roebuck & Co., 925 S. Homan, Chicago, Ill.
TYPE SET	AC Operated Radio-Phono Combination Superheterodyne Receiver With 3 Speed Manual Record Player
TUBES (Five)	Types 12BE6 Conv., 12BA6 IF Amp., 12AT6 Det-AVC-AF Amp., 50C5 Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC - 60 Cycles
RATING	.25 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	535KC - 1630KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1	.1MFD	High side to pin 7 (grid) of 12BE6 (V1). Low side to chassis.	455KC (400~ Mod.)	Tuning gang fully open.	Across voice coil.	A1, A2 A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2	"	"	1630KC	"	"	A5	"
3	"	Loop	1400KC	Tune to 1400KC signal.	"	A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA: SILVERTONE PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RETMA BASE TYPE	NOTES
V1	Converter	12BE6	12BE6	7CH	
V2	IF Amp.	12BA6	12BA6	7BK	
V3	Det-AVC-AF Amp.	12AT6	12AT6	7BT	
V4	Output	50C5	50C5	7CV	
V5	Rectifier	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: SILVERTONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	50	150	T18-304	PRS150/50-30		BBRD5315		TCD497	TVA-2450	Red
B	30	150								Yellow
C2	.05	200	T16-197	P288-05	DF-503	CUB2S5		PT415	2TM-S5	
C3	47		T15-229	SI47N750	TCN-47	TN14	N750K-470	NT-5447	5TCU-Q47	
C4	.05	200	T16-197	P288-05	DF-503	CUB2S5		PT415	2TM-S5	
C5	.05	400	T16-189	P488-05	DF-503	CUB4S5		PT415	4TM-S5	
C6	470	500	T15-200	1468-471	D6-471	5W5T47	GP2K-471	MC245	1FM-35	Note 1
C7A	220									
B	2000									
C	5000		♦T17-108	♦PA-113-1	♦PC-150	♦116TM1	♦1408-01		♦DT-1	
D	250									
E										
C8	.005	600	T16-190	P688-05	D6-502	CUB6D5	GP2-333-502	PT625	6TM-D5	
C9	.005	600	T16-190	P688-05	D6-502	CUB6D5	GP2-333-502	PT625	6TM-D5	
C10	.05	400	T16-189	P488-05	DF-503	CUB4S5		PT415	4TM-S5	
C11	.05	400	T16-189	P488-05	DF-503	CUB4S5		PT415	4TM-S5	

Note 1: Not used in all versions.
♦ Items C7A, C7B, C7C, C7D, C7E, R8A, R8B and R8C are combined in one unit.
When replacing items seperately, C7D and C7E should total 250MMF.

CONTROLS

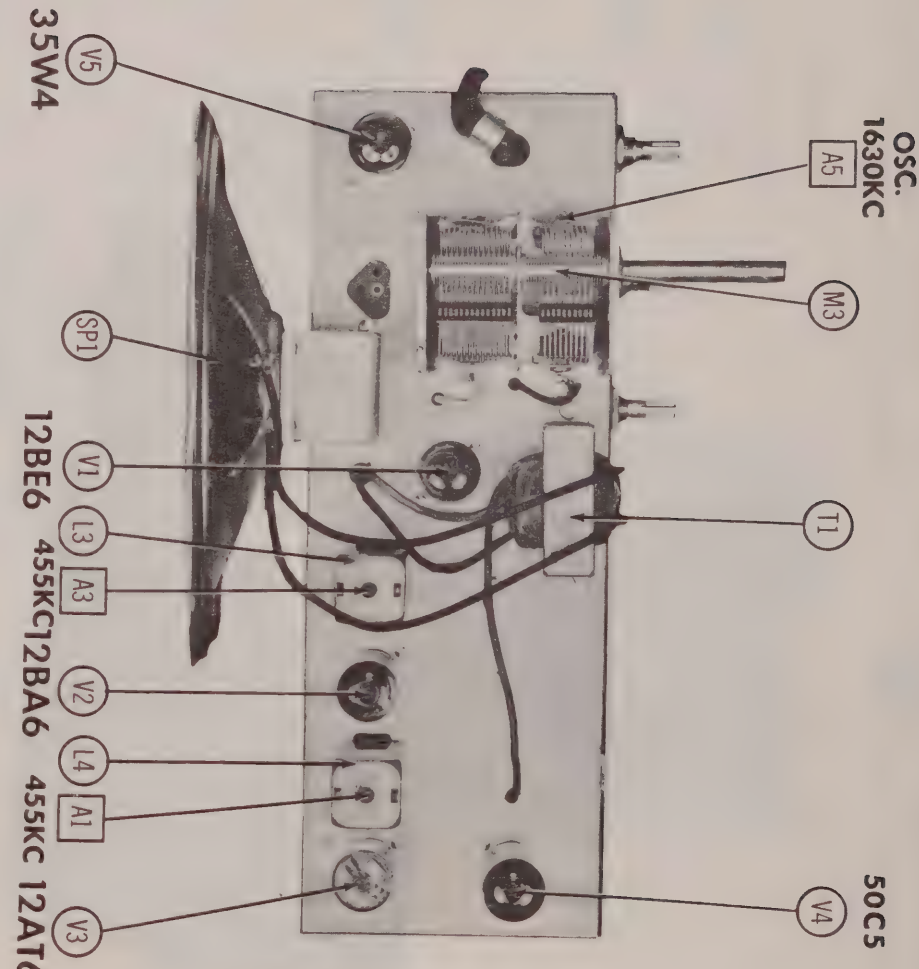
ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: SILVERTONE PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1Meg	½	A24-216	Q13-137	A47-1Meg-Z	AB-70	U-53	Volume
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R1A
C	Switch		Not Req.	76-1	SWE-12	KB-1	US-26	Attach to R1A
R2A	1Meg	½	A26-130	Q11-137	A47-1Meg-S	AB-69	U-54	Tone
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R2A

RESISTORS

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: SILVERTONE PART No.	REPLACEMENT DATA: IRC PART No.	NOTES
R3	22KΩ	½	T60-659	BTS-22K	
R4	2.2Meg	½	T60-726	BTS-2.2Meg	
R5	47Ω	½	T60-798	BTS-47	
R6	47KΩ	½	T60-730	BTS-47K	
R7	2.2Meg	½	T60-726	BTS-2.2Meg	
R8A	6.8Meg	½	♦T17-108	BTS-6.8Meg	
B	470KΩ	½		BTS-470K	
C	470KΩ	½		BTS-470K	
R9	180Ω	½	T60-774	BTS-180	
R10	1000Ω	1	T60-732	BTA-1000	
R11	27Ω	½	T60-690	BTS-27	

♦ Items R8A, R8B, R8C, C7A, C7B, C7C, C7D and C7E are combined in one unit.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	SILVERTONE PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	
T1	2.5KΩ	3.5Ω	80-268	A-3336	A-3031		Z1102	24S50A	

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	SILVERTONE PART No.	VIKING PART No.	QUAM PART No.	
SP1	4" x 6"	PM	3.5Ω	79-424	46J6	46A1	

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	SILVERTONE PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Loop Ant.	3.2Ω		T82-90				
L2	Osc. Coil	.8Ω	7.8Ω	T10-645	14-1074	BC-381 *	70-Osc	
L3	Input IF	20Ω	20Ω	T10-508	16-6758	BC-352	12-C1	
L4	Output IF	20Ω	20Ω	T10-479	16-6758	BC-353	12-C2	

* Drill mounting hole.

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA							REMARKS
	SILVERTONE PART No.	ASTATIC PART No.		SHURE PART No.		ELECTRO-VOICE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M1	T83-821	53-2T	G-AG-T					

ASTATIC NEEDLE LISTINGS SHOWN ABOVE ARE SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGES LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENT SEE BELOW.

PHONO NEEDLE

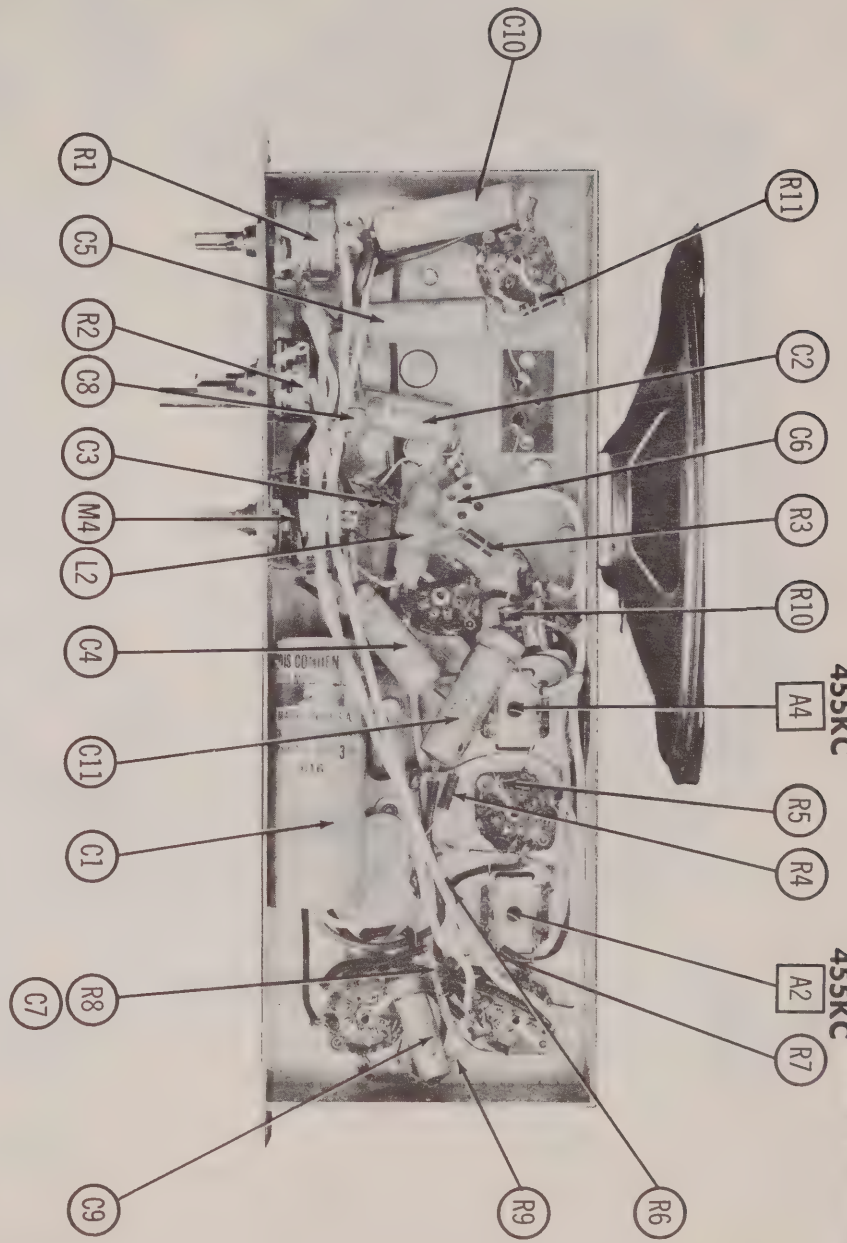
(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA				REMARKS
	SILVERTONE PART No.	JENSEN PART No.	PERMO PART No.	WALCO PART No.	
M2	T83-703	† A-742 or * A-842 or ♦A-742D	† B-334 or * B-326 or ♦ B-334D	† W-3AGS or * W-3AGA or ♦W-3AGD	* Metal † Jewel ♦ Diamond

MISCELLANEOUS

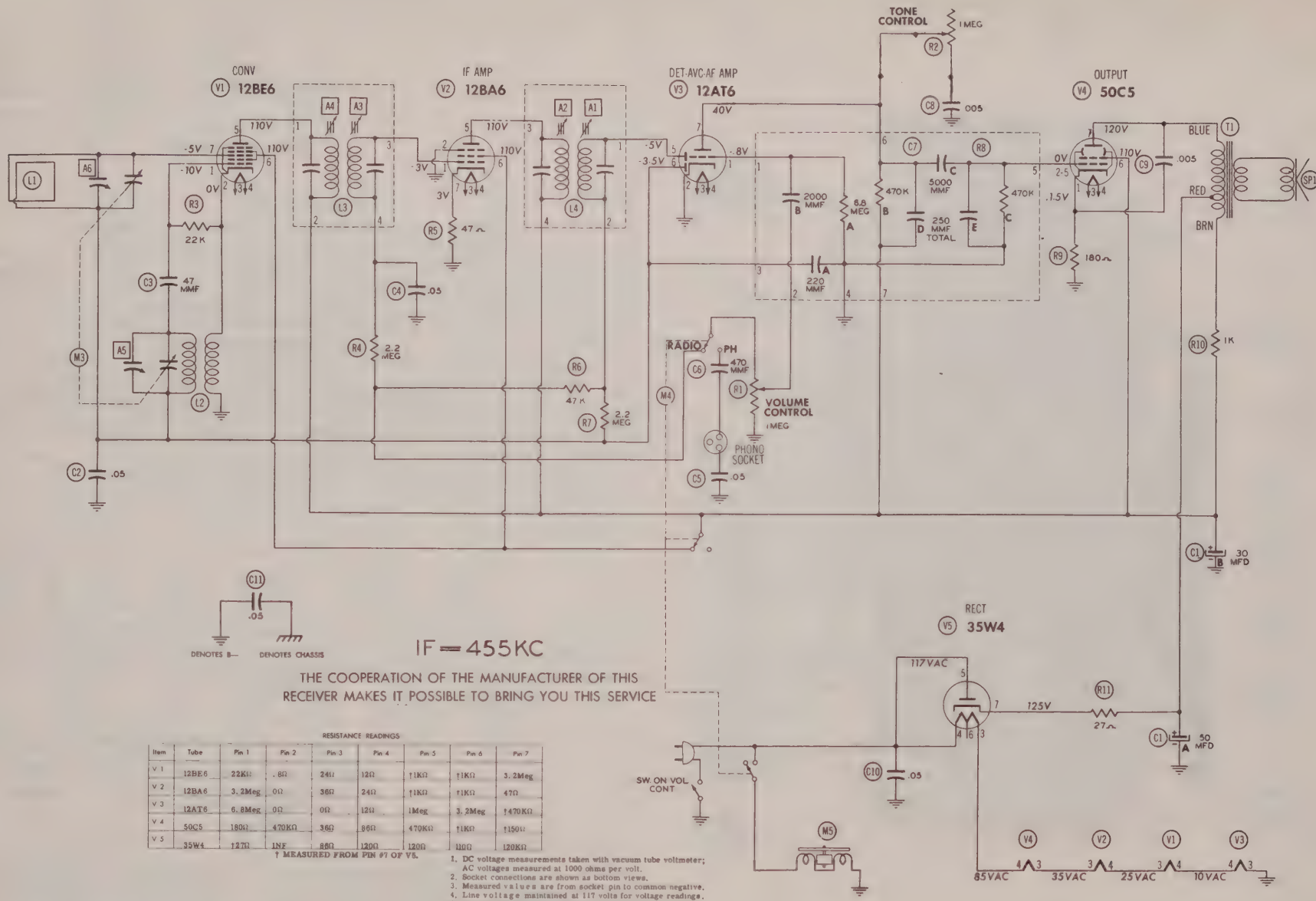
ITEM No.	PART NAME	SILVERTONE PART No.	NOTES
M3	Tuning Cap.	T19-235	15-455MMF, 27-190MMF
M4	Switch	T69-198	Radio - Phono
M5	Phono Motor	T59-36	3 Speed
	Cabinet	T42-661	
	Knob	T52-450	On-off-volume
	Knob	T52-449	Tone
	Knob	T52-451	Radio-phono switch
	Knob	T52-448	Tuning Disc

CHASSIS—BOTTOM VIEW



PROPERTY OF
L. F. BI
SILVERTONE
MODEL 4035 (Ch. 528.305)
3924 M
DENVER, C

SILVERTONE
MODEL 4035 (Ch. 528.305)



IF = 455KC

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12BE6	22KΩ	.8Ω	24Ω	12Ω	†1KΩ	†1KΩ	3.2Meg
V 2	12BA6	3.2Meg	0Ω	36Ω	24Ω	†1KΩ	†1KΩ	47Ω
V 3	12AT6	6.8Meg	0Ω	0Ω	12Ω	1Meg	3.2Meg	†470KΩ
V 4	50C5	180Ω	470KΩ	36Ω	86Ω	470KΩ	†1KΩ	†150Ω
V 5	35W4	†27Ω	1NF	86Ω	120Ω	120Ω	110Ω	120KΩ

† MEASURED FROM PIN #7 OF V5.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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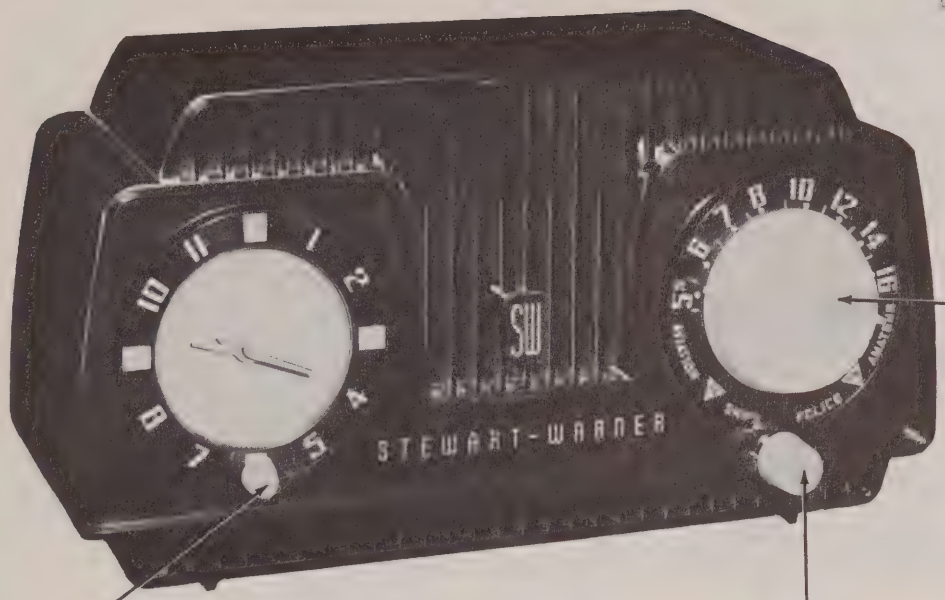
STEWART-WARNER
MODELS 9186A, B



STEWART-WARNER
MODELS 9186A, B

TRADE NAME	Stewart-Warner Models 9186A, 9186B
MANUFACTURER	Stewart-Warner Electric Div., of Stewart-Warner Corp., 1300 N. Kostner Ave., Chicago 15, Ill.
TYPE SET	AC Operated 2 Band AM Superheterodyne Receiver With Electric Clock
TUBES (Five)	Types 12BE6 Conv., 12BA6 IF Amp., 12AT6 Det.-AVC-AF Amp., 50C5 Output, 35W4 Rectifier

POWER SUPPLY 110-120 Volts AC-60 Cycles — RATING .25 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST 540KC - 1650KC — SHORT WAVE 1.8MC - 3MC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	200MMF	High side to antenna stator lug on tuning gang. Low side to B-.	455KC (400\Mod)	BC	Point of non-interference	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.	"	Loop	1650KC	"	Tuning gang fully open	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.	"	"	1500KC	"	Tune to 1500KC signal	"	A6	"
4.	400Ω Resistor	"	3MC	SW	Tune to 3MC signal	"	A7	"
5.	"	"	1.8MC	"	Tune to 1.8MC signal	"		Check for 1.8MC signal

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PARTS LIST AND DESCRIPTIONS

STEWART-WARNER MODEL 9186A

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		Stewart-Warner PART No.	STANDARD REPLACEMENT		
V1	Converter	12BE6	12BE6	7CH	
V2	IF Amplifier	12BA6	12BA6	7BK	
V3	Det.-AVC-AF Amp	12AT6	12AT6	7BT	
V4	Output	50C5	50C5	7CV	
V5	Rectifier	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	Stewart-Warner PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	50	150	520598	PR8150/50-50		BBRD5315		TCD497	TVA-2450	Red
B	30	150								
C2	944	500	512548							
C3	47		513002	SI47	D6-470	TP29	GP1K-470	UC-5447	5GA-Q47	
C4	5		513401	SI5N750	TCN-5	N011	N750K-050	NT-555	5TCUB-V5	
C5	.02	400	512208	P488-02	DF-203	CUB4S2	817-02	PT412	4TM-S2	
C6	.02	400	512208	P488-02	DF-203	CUB4S2	817-02	PT412	4TM-S2	
C7A	220									
B	2000									
C	5000		♦509836	♦PA-113-1	♦PC-150	♦116TM1	♦1408-01		♦DT-1	
D	250									
E										
C8	.02	400	512208	P488-02	DF-203	CUB4S2	817-02	PT412	4TM-S2	
C9	.05	400	512029	P488-05	DF-503	CUB4S5		PT415	4TM-S5	
C10	.15	400	512041	P488-15		CUB4P15		PT4015	4TM-P15	

♦ Items C7A, C7B, C7C, C7D, C7E, R6A, R6B, R6C are combined in one unit.
When replacing items separately, C7D and C7E should total 250MMF.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	Stewart-Warner PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	1Meg	½	521866	Q13-137	A47-1Meg-Z	BSK-70	U-53	Volume
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Not Req.	Attach to R1A

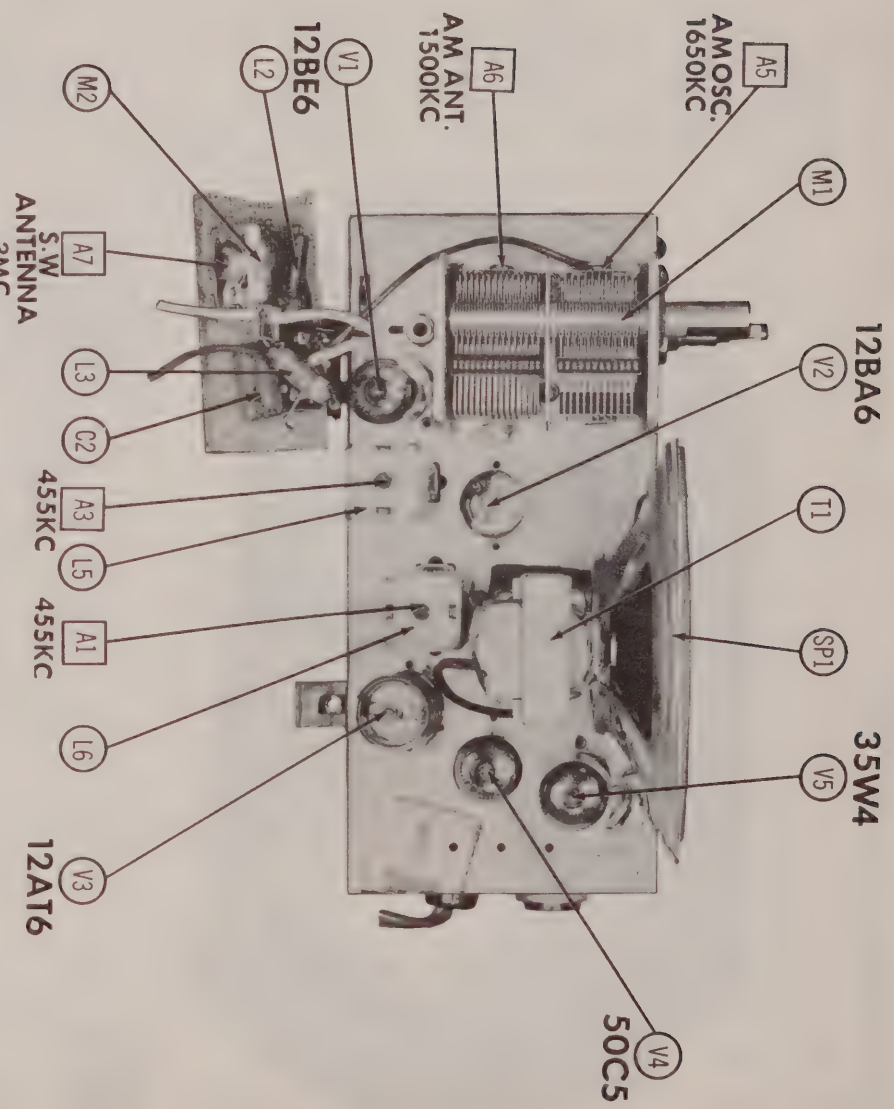
RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	Stewart-Warner PART No.	IRC PART No.	
R2	22KΩ	½	510161	BTS-22K	
R3	100KΩ	½	510173	BTS-100K	
R4	100Ω	½	510119	BTS-100	
R5	2.2Meg	½	510193	BTS-2.2Meg	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	Stewart-Warner PART No.	IRC PART No.	
R6A	6.8Meg	½	♦509836	BTS-6.8Meg	
B	470KΩ	½		BTS-470K	
C	470KΩ	½		BTS-470K	
R7	150Ω	½	510122	BTS-150	
R8	1000Ω	1	510237	BTA-1000	

♦ Items R6A, R6B, R6C, C7A, C7B, C7C, C7D and C7E are combined in one unit.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA Stewart-Warner PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	NOTES
T1	2.4KΩ	3.1Ω	522151 ① 522152 ②						① Clinch type mounting. ② Rivet type mounting.

SPEAKER

ITEM No.	RATINGS SIZE	RATINGS FIELD	RATINGS V. C. IMP.	REPLACEMENT DATA Stewart-Warner PART No.	JENSEN PART No.	QUAM PART No.	NOTES
SP1	4"	PM	3.1Ω	521633	ST-113 Mod. P4-X	4A07	

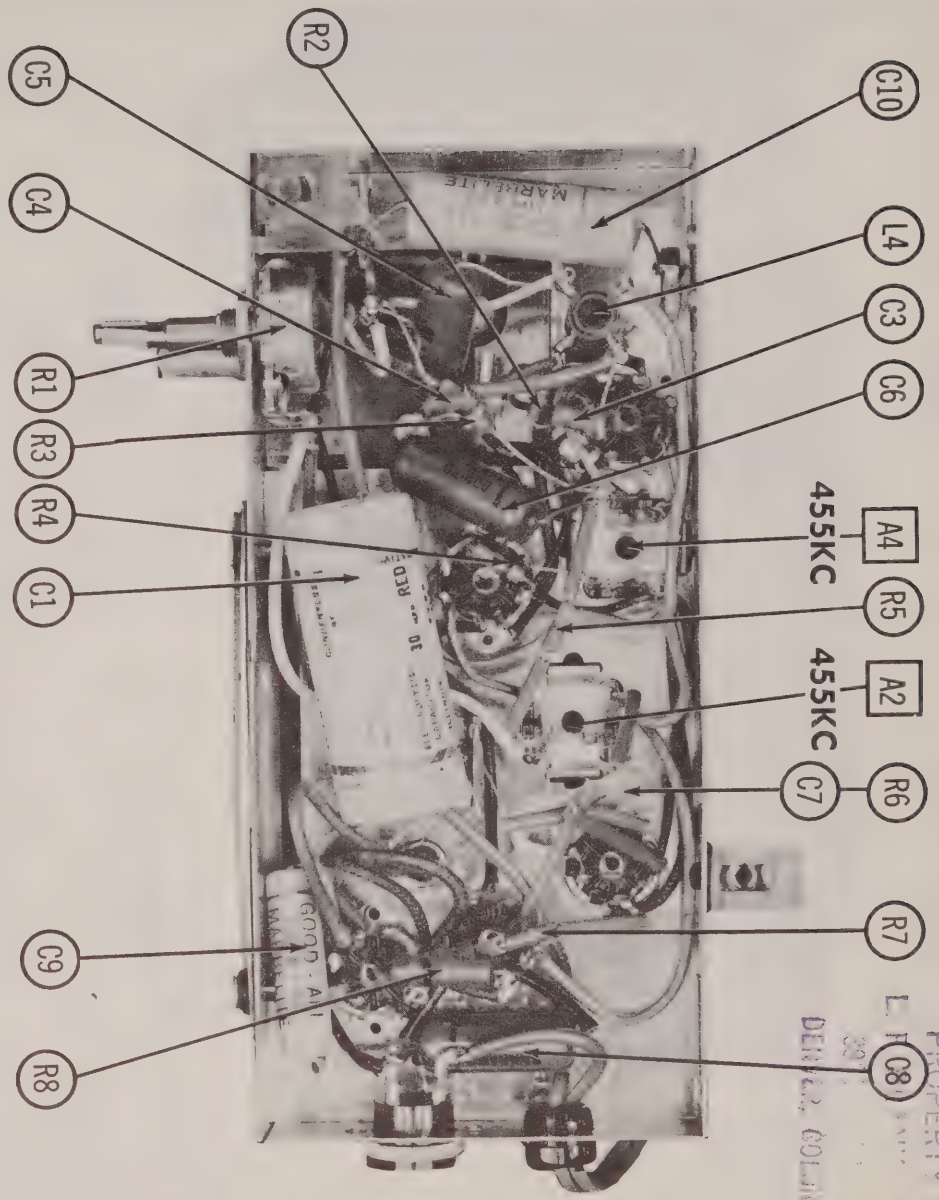
COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA Stewart-Warner PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	Loop Ant.	2.9Ω		521770				Includes cabinet back
L2	SW Ant. Coil	1.7Ω		521659	19-6022		4626	29 Microhenries
L3	SW Osc. Coil	3Ω		521754	19-3036	TV-180	6176	
L4	BC Osc. Coil	.7Ω	6.5Ω	521756	14-1074	BC-381	71-Osc.	
L5	Input IF	17Ω	17Ω	509433	16-6758	BC-352	12-C1	
L6	Output IF	17Ω	17Ω	509433	16-6758	BC-353	12-C2	

MISCELLANEOUS

ITEM No.	PART NAME	Stewart-Warner PART No.	NOTES
M1	Tuning Cap.	521628	44-507MMF, 22-170MMF
M2	Switch	521655	Band
M3	Clock	521919	Includes on-off switch
A7	Trimmer Cap.	521766	Ant.-ASPA Band (4-70MMF)
	Cabinet	522133	Model 9186-A
	Cabinet	521857	Model 9186-B
	Knob	522533	Clock - tan
	Knob	521930	Tuning - tan
	Knob	521698	Volume - tan
	Cover	521864	Clock
	Crystal	521820	Clock

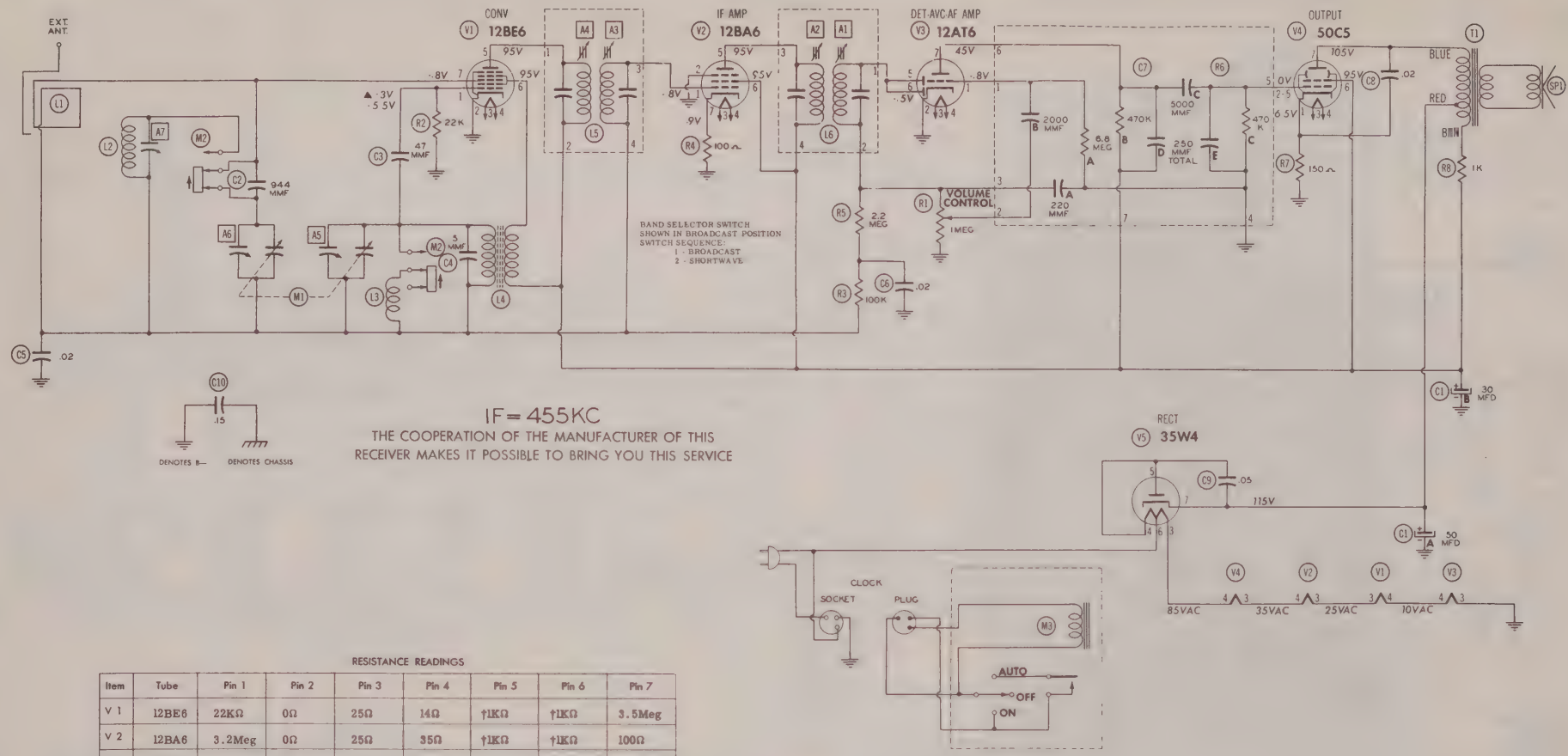
CHASSIS—BOTTOM VIEW



PROPERTY OF

STEWART-WARNER MODEL 9186A

STEWART-WARNER MODEL 9186A



IF = 455KC

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12BE6	22KΩ	0Ω	25Ω	14Ω	†1KΩ	†1KΩ	3.5Meg
V 2	12BA6	3.2Meg	0Ω	25Ω	35Ω	†1KΩ	†1KΩ	100Ω
V 3	12AT6	6.8Meg	0Ω	0Ω	14Ω	1Meg	1Meg	†470KΩ
V 4	50C5	150Ω	470KΩ	35Ω	85Ω	470KΩ	†1KΩ	†200Ω
V 5	35W4	†10Ω	INF	85Ω	120Ω	120Ω	110Ω	70KΩ

ALL MEASUREMENTS TAKEN IN "BC" BAND UNLESS OTHERWIDE DESIGNATION
† MEASURED FROM PIN 7 OF V5
▲ MEASURED IN"ASPA" BAND

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pins to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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PROPERTY O
L. F. P
3024 WEADE ST.
DENVER, COLORADO

TRUETONE
MODEL D2385 (Ch. WA-4B1)

VOLUME CONTROL ON-OFF SWITCH

TUNING

TRUETONE
MODEL D2385 (Ch. WA-4B1)

TRADE NAME	Truetone Model D2385 (Ch. WA-4B1)
SUPPLIER	Western Auto Supply Co., 2107 Grand Ave., Kansas City, Mo.
TYPE SET	Battery Operated AM Superheterodyne Receiver
TUBES (Four)	Types 1R5 Conv., 1U4 IF Amp., 1U5 Det.-AVC-AF Amp., 3V4 Output
POWER SUPPLY	1½ Volts "A" Supply & 90 Volts "B" Supply in Pack Form
RATING	250MA @ 1.5 Volts DC & 15MA @ 90 Volts DC
TUNING RANGE—BROADCAST	540KC-1650KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain and output reading. Use an insulated alignment screwdriver for adjusting.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 6 (grid) of 1R5 (V1). Low side to chassis.	455KC (400~Mod)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.	"	High side to antenna stator lug. Low side to chassis.	1650KC	"	"	A5	"
3.	200MMF	High side to external antenna lead. Low side to chassis.	1400KC	Tune to 1400KC signal	"	A6	"

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PARTS LIST AND DESCRIPTIONS

TRUETONE
MODEL D2385 (Ch. WA-4B1)

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA: TRUETONE PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RETMA BASE TYPE	NOTES
V1	Converter	1R5	1R5	7AT	
V2	IF Amplifier	1U4	1U4	6AR	
V3	Det.-AVC-AF Amp.	1U5	1U5	6BW	
V4	Output	3V4	3V4	6BX	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: TRUETONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1	20	150		PRS150/20		BR2015		TC45	TVA-1410	Note 1
C2	.05	200	152-104	P288-05	DF-503	PJ285		PT415	2TM-S5	
C3	100		156-102							
C4	10000		154-102	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C5	.047	200	152-104	P288-05	DF-503	PJ285		PT415	2TM-S5	
C6A	150		♦166-102	♦PA-136	♦PC-160	TP36	GP1K-151	UC-5315	♦DP-1	
B	2000					K072	801-002	DC-522		
C	10000					K082	811-01	DC-511		
D	150					TP36	GP1K-151	UC-5315		
E	5000					K080	801-005	DC-525		
C7	5000		154-101	BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	

♦ Items C6A, C6B, C6C, C6D, C6E, R7A, R7B, R7C and R7D are combined in one unit.
Note 1. Some versions may use a 4MFD @ 150V in this application.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: TRUETONE PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1Meg	½	120-102	Q13-137	A47-1Meg-Z	B-70-S	U-53	Volume
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	76-2	SWE-20	Not Req.	US-27	Attach to R1A

RESISTORS

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: TRUETONE PART No.	REPLACEMENT DATA: IRC PART No.	NOTES
R2	100KΩ	½	180-118	BTS-100K	
R3	15KΩ	½	180-115	BTS-15K	
R4	180Ω	½	180-118	BTS-180	Note 1
R5	1Meg	½		BTS-1Meg	Note 2
R6	2.2Meg	½	180-107	BTS-2.2Meg	

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: TRUETONE PART No.	REPLACEMENT DATA: IRC PART No.	NOTES
R7A	10Meg	½	♦166-102	BTS-10Meg	
B	4.7Meg	½		BTS-4.7Meg	
C	1Meg	½		BTS-1Meg	
D	3.3Meg	½		BTS-3.3Meg	
R8	330Ω	½	180-117	BTS-330	

Note 1. Not used in some versions.
Note 2. Some versions may use a 680KΩ resistor in this application.
♦ Items R7A, R7B, R7C, R7D, C6A, C6B, C6C, C6D and C6E are combined in one unit.

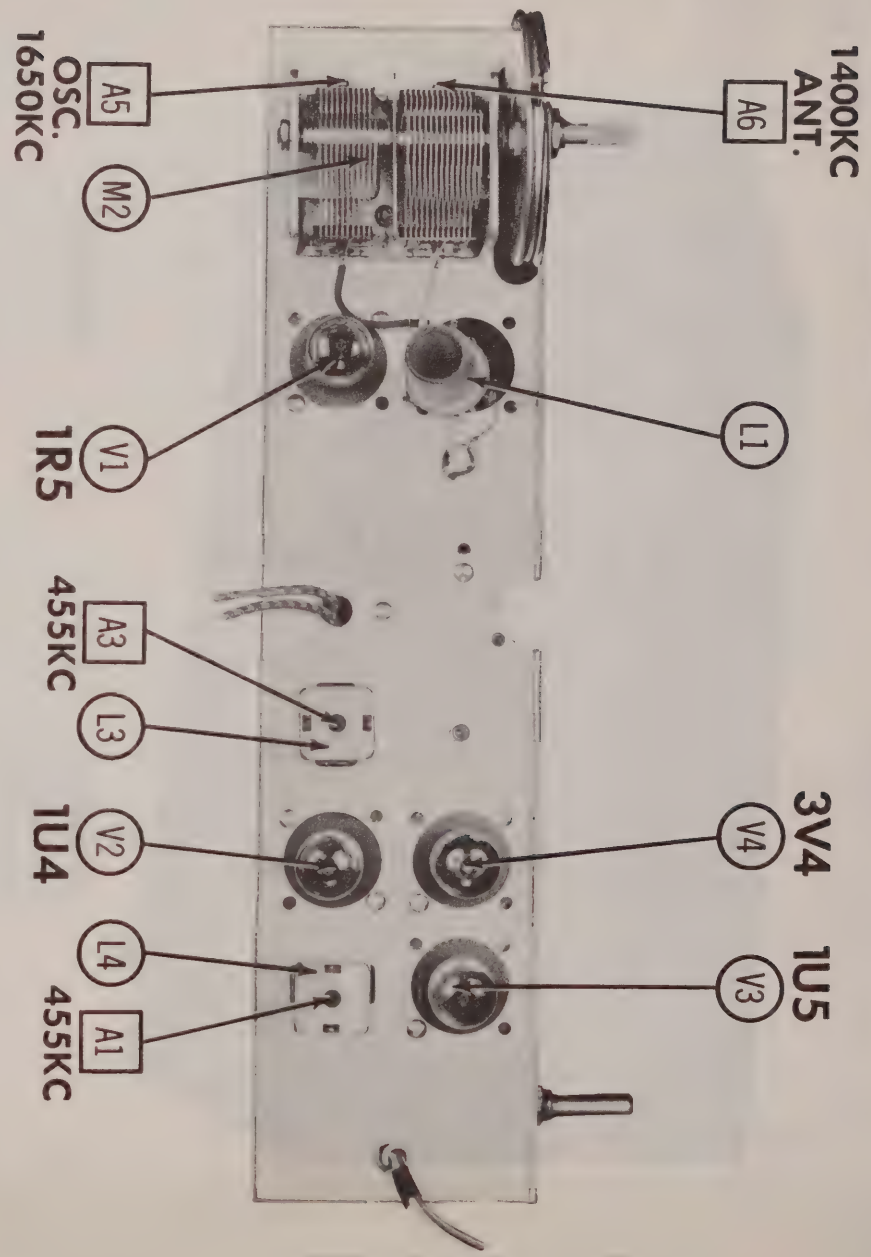
TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE: PRI.	IMPEDANCE: SEC.	REPLACEMENT DATA: TRUETONE PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	NOTES
T1	9.8KΩ	3.3Ω	138-102	A-3329	A-2927 ①	S-11X	Z1116 ①	24S49	① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS: SIZE	RATINGS: FIELD	RATINGS: V. C. IMP.	REPLACEMENT DATA: TRUETONE PART No.	JENSEN PART No.	QUAM PART No.	NOTES
SP1	5"	PM	3.3Ω	175-103	ST-105 Mod. P5-X	5A1	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA: TRUETONE PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	Ant. Coil	37Ω	4.3Ω	132-101	14-1022	BC-412	43-A	
L2	Osc. Coil	1.6Ω	5.5Ω	136-105	14-1074 *	BC-381 ■	71-Osc.*	
L3	Input IF	25Ω	25Ω	130-104	16-6758	BC-352	12-C1	
L4	Output IF	25Ω	25Ω	130-104	16-6758	BC-353	12-C2	

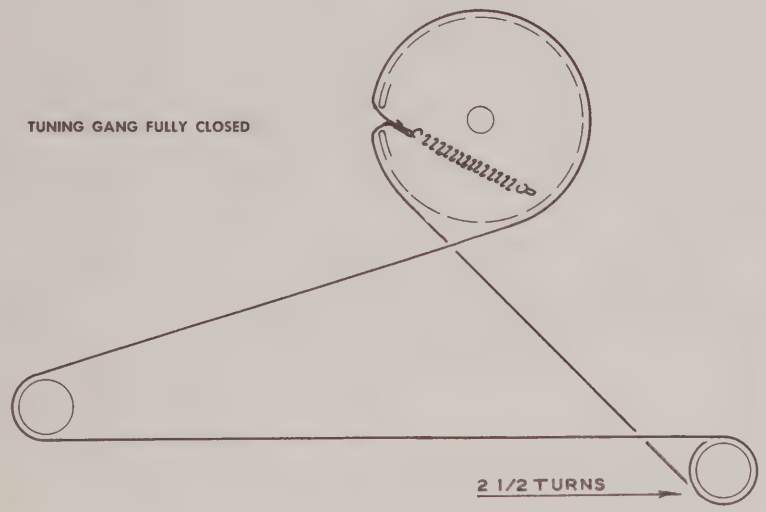
* Drill mounting hole.
■ Leads sufficient mounting support.

BATTERIES

ITEM No.	VOLTAGE	TRUETONE PART No.	REPLACEMENT DATA: EVEREADY "A"	EVEREADY "B"	EVEREADY "A-B"	BURGESS "A"	BURGESS "B"	BURGESS "A-B"	INSTALLATION NOTES
M1	1.5V "A" 90V "B"	3B6430			759			17GD60	

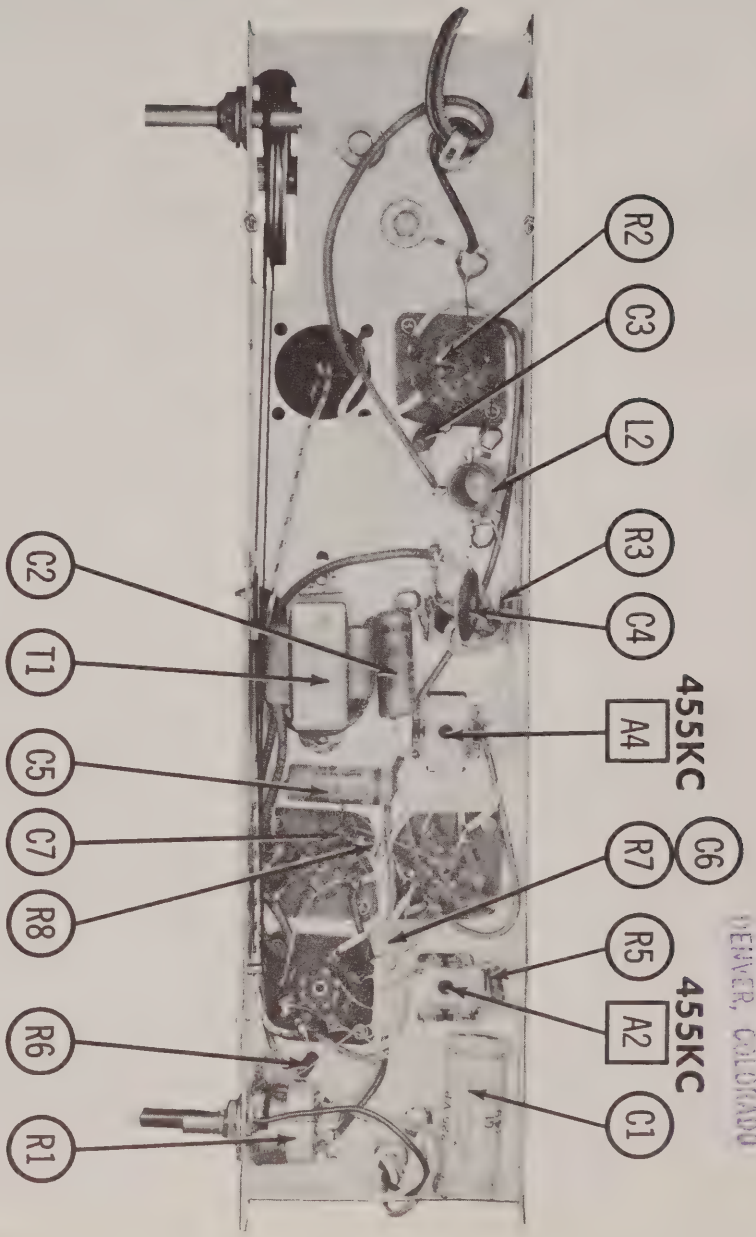
MISCELLANEOUS

ITEM No.	PART NAME	TRUETONE PART No.	NOTES
M2	Tuning Cap.	160-102	34-480MMF, 38-220MMF
	Cabinet	210-102	
	Knob	220-101	On-off-volume and tuning
	Pointer	140-104	
	Dial Scale	215-102	



DIAL CORD STRINGING

CHASSIS—BOTTOM VIEW



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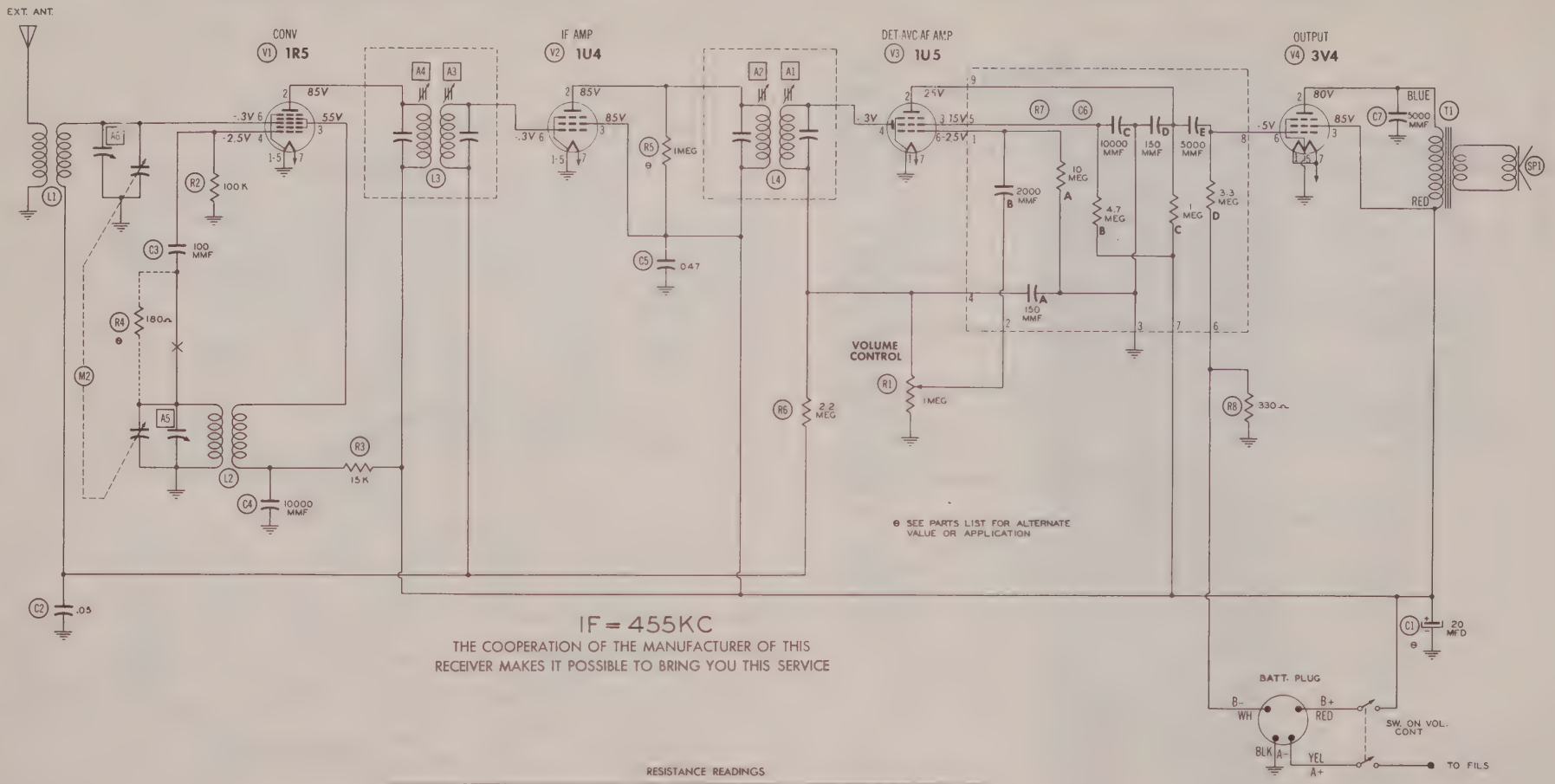
TRUETONE
MODEL D2385 (Ch. WA-4B1)



θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

IF = 455KC

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RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	1R5	*	†25Ω	†15KΩ	100KΩ	*	3.2Meg	*
V 2	1U4	*	†25Ω	†25Ω	330Ω	*	3.2Meg	*
V 3	1U5	*	†1Meg	†4.7Meg	1Meg	3.2Meg	10Meg	*
V 4	3V4	*	†328Ω	†0Ω	INF	*	3.3Meg	*

† MEASURED FROM PIN 3 OF V4
* DO NOT USE OHMMETER TO MEASURE FILAMENT RESISTANCE

1. DC voltage measurements taken with vacuum tube voltmeter. AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements

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MODEL 321GM44-B-462

WELLS-GARDNER MODELS
321GM44-A & B-462, 321GM44-A & B-464

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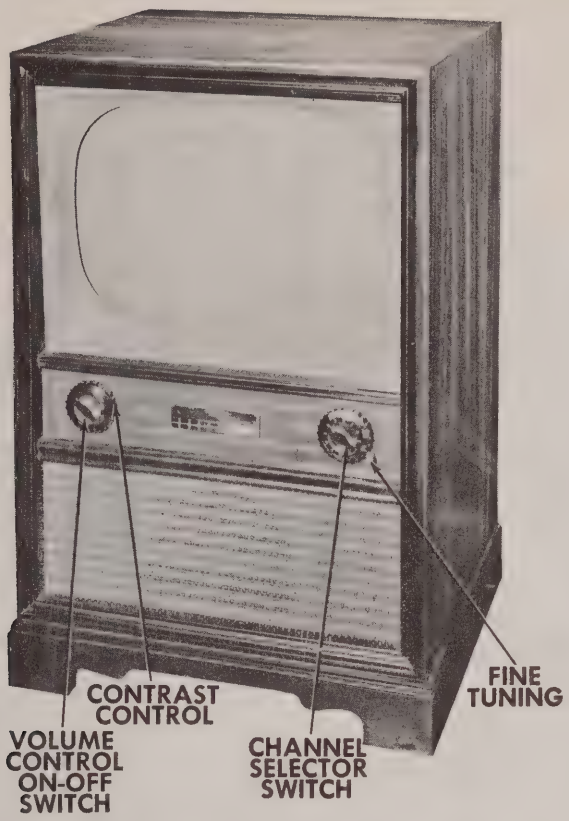

WELLS-GARDNER MODEL 321GM44-B-462

TRADE NAME	Wells-Gardner Models 321GM44-A-462, 321GM44-B-462, 321GM44-A-464, 321GM44-B-464
MANUFACTURER	Wells-Gardner & Co., 2701 N. Kildare Ave., Chicago 39, Ill.
TYPE SET	Television Receiver
TUBES	Twenty-five
POWER SUPPLY	110-120 Volts AC-60 Cycle RATING 2.16 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)

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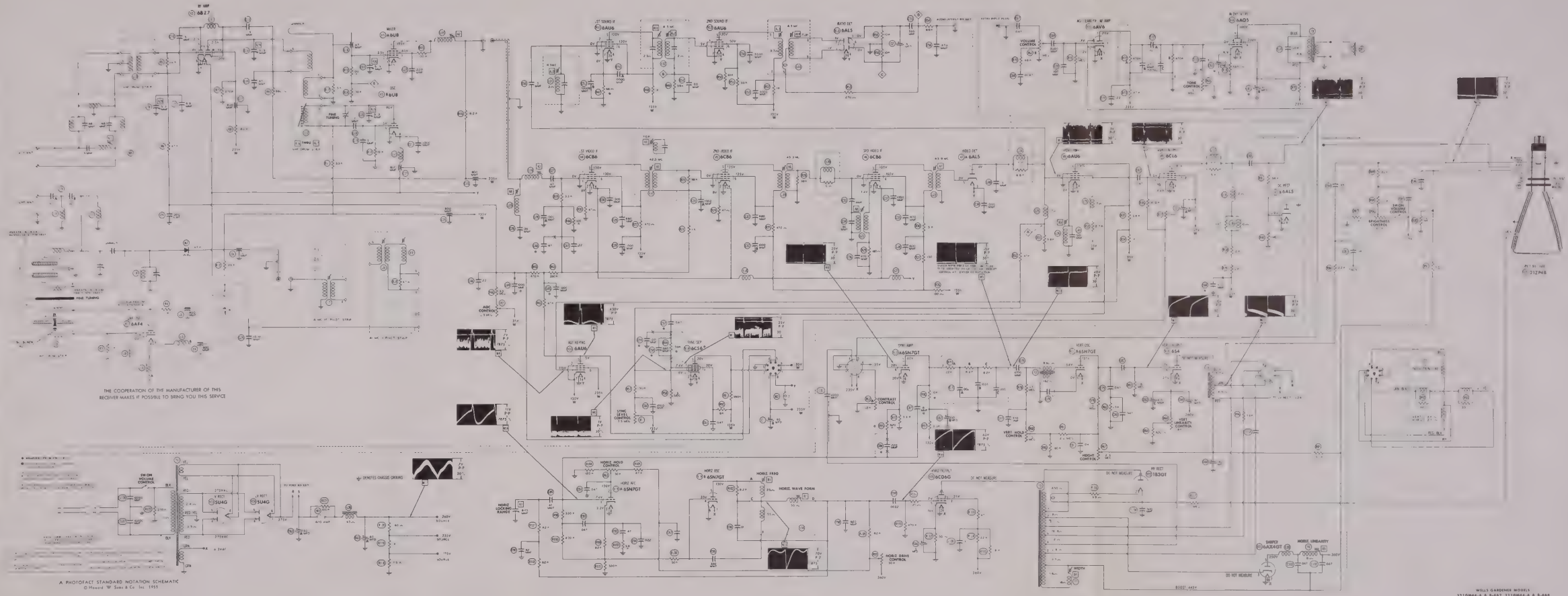
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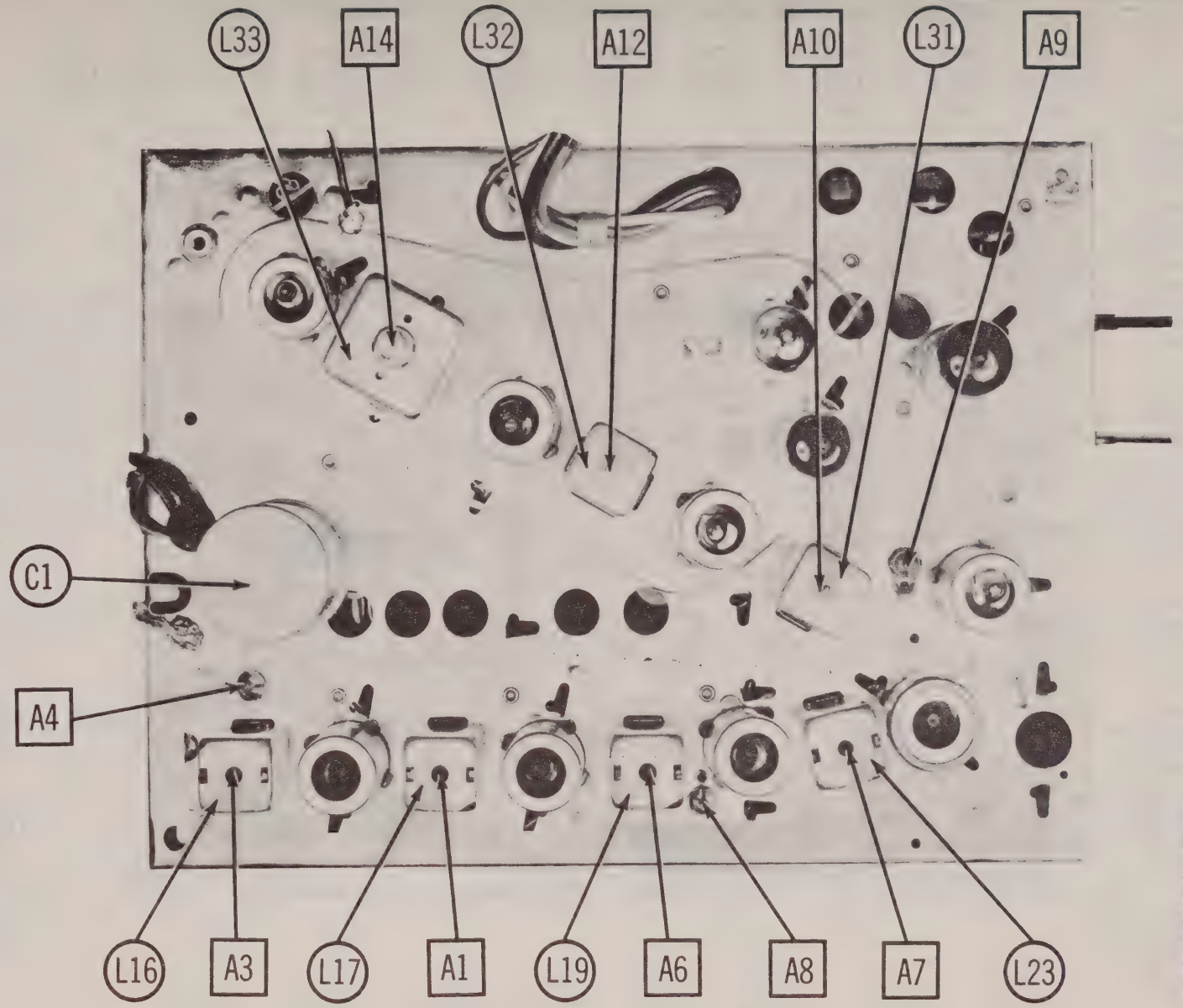

RF-IF CHASSIS-TOP VIEW

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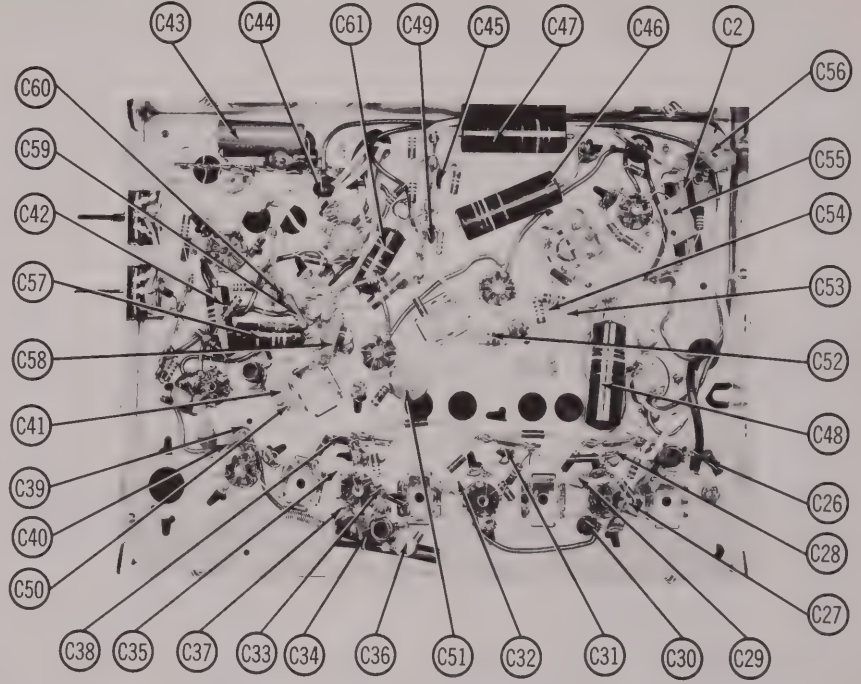

RF-IF CHASSIS-BOTTOM VIEW-CAPACITOR IDENTIFICATION

TUBE PLACEMENT CHART

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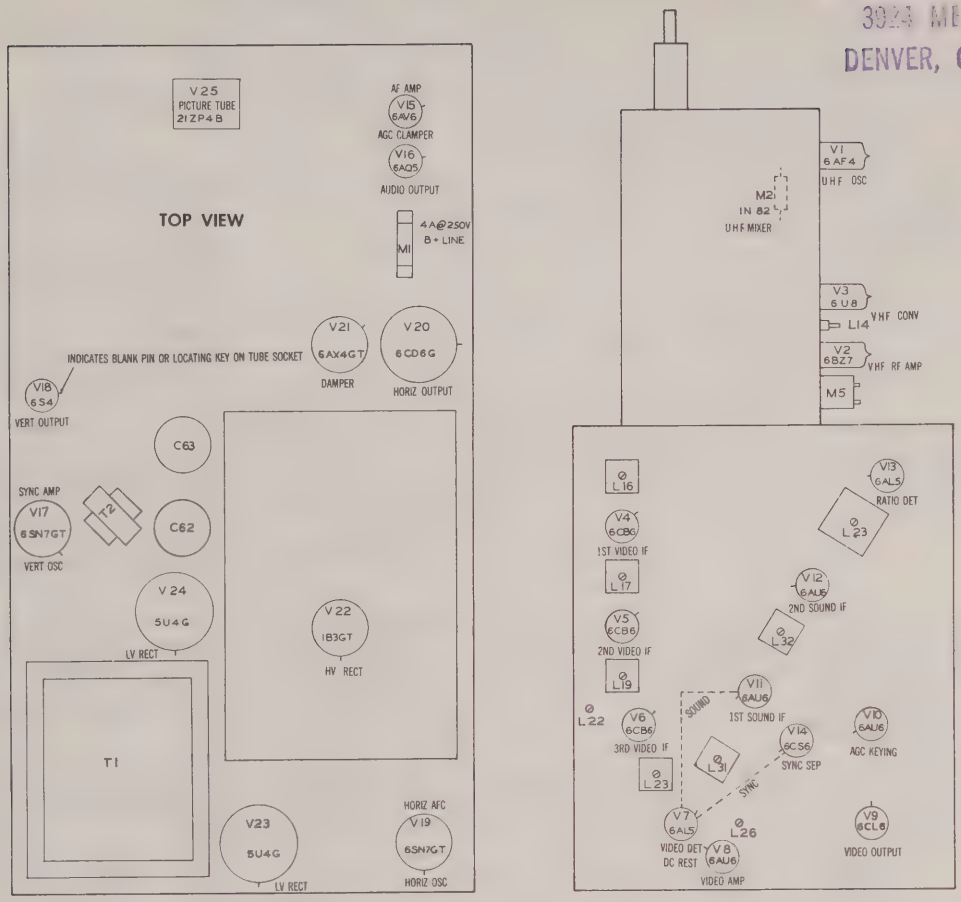

TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - V23, V24, Fuse (M1)

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - V3, V4, V5, V6, V7, (V1 UHF only)
No pic, no sound, has snow - V2, V3, V4
No pic, has sound, has raster - V8, V9, V10, V25
Has pic, no sound - V11, V12, V13, V14, V15, V16
Overloaded picture - V10, V15

SYNC FAILURE
No vert. sync - V17
No horiz. sync - V17, V19
No vert. or horiz. sync - V14, V17

SWEEP FAILURE
No raster, has sound - V19, V20, V21, V22, V25
No vertical deflection - V17, V18
Poor vert. linearity or foldover - V17, V18
Poor horiz. linearity or foldover - V19, V20, V21
Narrow picture - V19, V20, V21, V22, V23, V24
Vert. off freq. - V17
Horiz. off freq. - V17, V19

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage lead should be securely taped and kept away from the chassis. Do not remove the horizontal oscillator tube to disable the high voltage.

VIDEO IF ALIGNMENT

Connect the negative lead of a 1.5 volt battery to the ungrounded side of C28A. Connect the positive lead to chassis.
Remove the RF amplifier tube (V2) from its socket.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over converter tube (V3). Low side to tuner chassis.	44MC (10MC Swp)	41.25MC 45.75MC 47.25MC	Any unused channel	Vert. Amp. thru detector (Fig.1) to pin 5 (plate) of 6CB6 (V4). Low side to chassis.	A1, A2, A3, A4	Adjust A1 to place 47.25MC marker in trap notch as in Fig. 2. Adjust A2, A3 and A4 for response similar to Fig. 2. A2 and A3 affects flat portion of curve. A4 positions the 41.25MC marker. Make sure 45.75MC marker is on peak as shown or the 44.5MC marker on overall response curve (Fig.3) will be incorrect.
2.	"	"	Not used	42.5MC (Unmod)	"	Use VTVM DC probe to point Ⓐ. Common to chassis.	A5	Increase bias from 1.5 volts to 4.5 volts at ungrounded side of C28A. Attenuate generator output to maintain 1 volt at VTVM. Adjust for maximum deflection.
3.	"	"	"	45.3MC	"	"	A6	"
4.	"	"	"	43.9MC	"	"	A7	"
5.	"	"	"	41.25MC	"	"	A8	Adjust for MINIMUM deflection.
6.	"	"	44MC (10MC Swp)	41.25MC 42.25MC 42.5MC 43.9MC 44.5MC 45.3MC 45.75MC 47.25MC	"	Vert. Amp. thru 10KΩ to point Ⓐ. Low side to chassis.		Check for response curve similar to Fig.3. SLIGHTLY retouch A5 thru A8 to obtain desired response. If A1 thru A4 requires retouching step 1 should be repeated.

4.5MC TRAP ALIGNMENT

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
7.	10KΩ	High side thru 10KΩ to pin 2 (plate) of 6AL5 (V7A). Low side to chassis.	Not used	4.5MC (400∿Mod)	Any unused channel	Vert. Amp. to pin 2 (grid) of picture tube. Low side to chassis.	A9	Adjust for MINIMUM 400∿ indication on scope.

ALTERNATE 4.5MC TRAP ALIGNMENT

Replace the RF amplifier (V2) and remove bias battery. Tune in a TV station and adjust A9 for minimum 4.5MC beat interference in picture.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Remove 6CB6 (V6) from its socket.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
8.	10KΩ	High side thru 10KΩ to pin 2 (plate) of 6AL5 (V7A). Low side to chassis.	4.5MC (Unmod)	Any	DC probe to point Ⓑ. Common to chassis.	A10, A11, A12	Adjust for maximum deflection.
9.	"	"	"	"	DC probe to point Ⓒ. Common to chassis.	A13	Use only enough generator output to provide usable indication at VTVM. Adjust for maximum deflection.
10.	"	"	"	"	DC probe to point Ⓓ. Common to chassis.	A14	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting. Replace V6 in its socket.

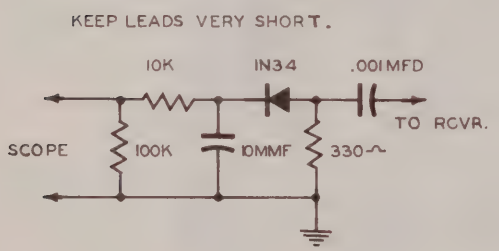

FIG. 1

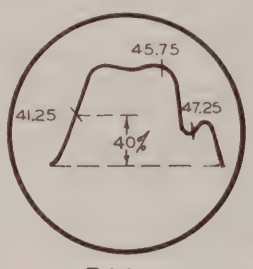

FIG. 2

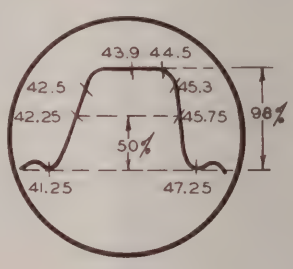

FIG. 3

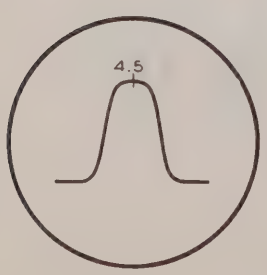

FIG. 4

FIG. 5

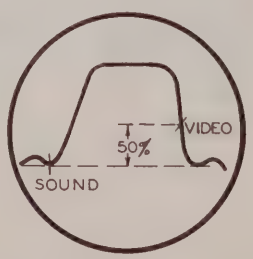

FIG. 6

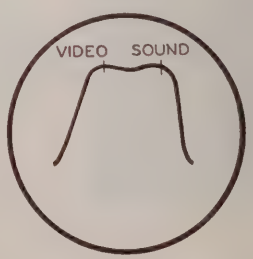

FIG. 7

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ALIGNMENT INSTRUCTIONS (cont)

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Remove 6CB6 (V6) from its socket.
Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	10KΩ	High side thru 10KΩ to pin 2 (plate) of 6AL5 (V7A). Low side to chassis.	4.5MC (450KC Swp)	4.5MC	Any	Vert. Amp. to point Ⓑ. Low side to chassis.	A10,A11, A12	Adjust for curve o maximum amplitude and symmetry similar to Fig. 4.
9.	"	"	"	"	"	Vert. Amp. to point Ⓒ. Low side to chassis.	A13	Disconnect stabilizing capacitor C2. Use only enough sweep generator output to provide usable indication on scope. Adjust for curve of maximum amplitude and symmetry similar to Fig. 4.
10.	"	"	"	"	"	Vert. Amp. to point Ⓓ. Low side to chassis.	A14	Reconnect stabilizing capacitor C2. Adjust so that 4.5MC occurs at center of crossover lines as in Fig. 5. SLIGHTLY retouch A14 for maximum amplitude and straightness of crossover lines. Replace V6 in its socket.

OSCILLATOR ALIGNMENT

Connect the negative lead of a 4.5 volt bias battery to the ungrounded side of C28A. Connect the positive lead to chassis.
Complete oscillator alignment may not be necessary. If the oscillator seems to be off frequency approximately the same amount for a majority of the channels it may be possible to correct them in one step using A15. It should be noted that this is an all channel oscillator circuit adjustment and should not be used to correct any individual channel. If adjustment of A15 will not bring all channels well within the range of the fine tuning control it will be necessary to adjust the channel strip adjustment screw for each channel that is off frequency. The channel oscillator adjustment screws are reached through a hole just to the left of the channel switch shaft (hole extends)through UHF tuner).
The correct adjustment screw is accessible through this hole as the channel switch is turned to each channel. Replace RF amplifier (V2) in its socket.
Remove bias battery.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
11.	Two 120Ω Carbon Resistors	Across VHF antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. Amp. thru 10KΩ to point Ⓐ. Low side to chassis.	A16	Adjust to place sound marker in trap notch as in Fig. 6. Video marker should be at 50%.
			207MC (10MC Swp)	205.25MC 209.75MC	12		A17	
			201MC (10MC Swp)	199.25MC 203.75MC	11		A18	
			195MC (10MC Swp)	193.25MC 197.75MC	10		A19	
			189MC (10MC Swp)	187.25MC 191.75MC	9		A20	
			183MC (10MC Swp)	181.25MC 185.75MC	8		A21	
			177MC (10MC Swp)	175.25MC 179.75MC	7		A22	
			85MC (10MC Swp)	83.25MC 87.75MC	6		A23	
			79MC (10MC Swp)	77.25MC 81.75MC	5		A24	
			69MC (10MC Swp)	67.25MC 71.75MC	4		A25	
			63MC (10MC Swp)	61.25MC 65.75MC	3		A26	
			57MC (10MC Swp)	55.25MC 59.75MC	2		A27	

RF AND MIXER ALIGNMENT

Connect the negative lead of a 3 volt bias battery to the ungrounded side of C48. Connect the positive lead to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
12.	Two 120Ω Carbon Resistors	Across VHF antenna terminals with 120Ω in each lead.	207MC (10MC Swp)	205.25MC 209.75MC	12	Vert. Amp. thru 10KΩ to point Ⓔ. Low side to chassis.	A28,A29 A30	Adjust for response curve similar to Fig.7 with markers above 90%.
13.	"	"	213MC (10MC Swp)	211.25MC 215.75MC	13	"		If markers fall below 70% on any channel make compromise adjustments of A28, A29 and A30 with channel switch set to that channel. Then check all other channels to see that they have not been seriously affected.
			201MC (10MC Swp)	199.25MC 203.75MC	11			
			195MC (10MC Swp)	193.25MC 197.75MC	10			
			189MC (10MC Swp)	187.25MC 191.75MC	9			
			183MC (10MC Swp)	181.25MC 185.75MC	8			
			177MC (10MC Swp)	175.25MC 179.75MC	7			
			85MC (10MC Swp)	83.25MC 87.75MC	6			
			79MC (10MC Swp)	77.25MC 81.75MC	5			
			69MC (10MC Swp)	67.25MC 71.75MC	4			
			63MC (10MC Swp)	61.25MC 65.75MC	3			
			57MC (10MC Swp)	55.25MC 59.75MC	2			

IF WAVE TRAP ADJUSTMENT

The IF wave trap should be tuned to minimize interference caused by signals which fall within the video IF band pass (40-48MC). Tune in a station on which the interference is noted and adjust A31 for minimum interference in the picture.

UHF OSCILLATOR ADJUSTMENT

The UHF oscillator channel strip adjustments are reached through the same hole provided for VHF channel oscillator adjustment screws. Tune in all UHF stations available and check each one to see if the fine tuning control can be tuned through a point where clearest picture and best sound occur. If the fine tuning control does not have sufficient range on any UHF channel strip set the fine tuning control to its mid range position and then adjust the UHF channel strip oscillator screw for clearest picture and best sound.

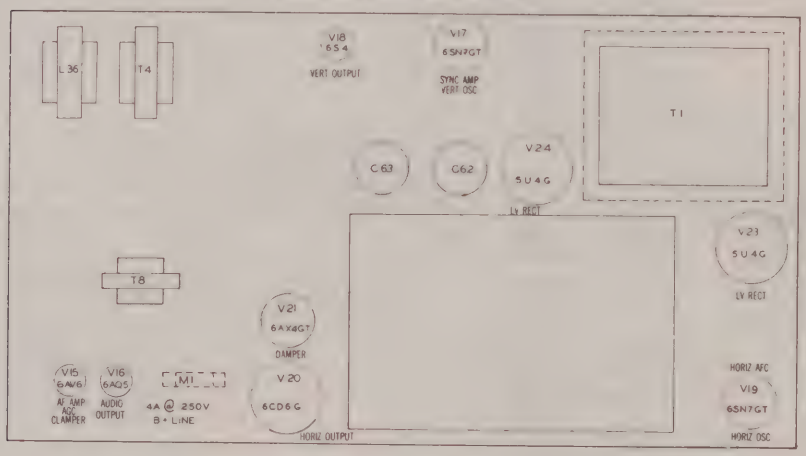
UHF RF ALIGNMENT

The UHF RF portion of this receiver has been properly aligned at the factory and is very stable.
If the RF section should ever require alignment or major repair of the UHF tuner become necessary, the entire UHF tuner should be returned to the factory service department.

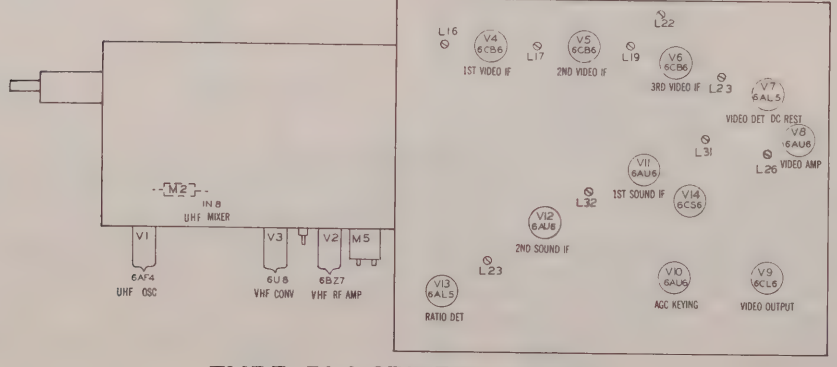
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AF4	†▲5. 5KΩ	10KΩ	. 1Ω	0Ω	0Ω	10KΩ	†▲5. 3KΩ		
V 2	6BZ7	† 900Ω	120KΩ	INF.	0Ω	. 1Ω	INF.	950KΩ	0Ω	0Ω
V 3	6U8	† 5. 5KΩ	200KΩ	†100KΩ	. 1Ω	0Ω	† 8. 4KΩ	0Ω	0Ω	10KΩ
V 4	6CB6	100KΩ	47Ω	0Ω	. 1Ω	† 1. 7KΩ	† 1. 7KΩ	0Ω		
V 5	6CB6	100KΩ	47Ω	0Ω	. 1Ω	† 1. 8KΩ	† 1. 8KΩ	0Ω		
V 6	6CB6	. 1Ω	180Ω	0Ω	. 1Ω	† 3KΩ	† 3KΩ	0Ω		
V 7	6AL5	1 Meg	3. 9KΩ	. 1Ω	0Ω	. 5Ω	0Ω	0Ω		
V 8	6AU6	3. 0KΩ	0Ω	0Ω	. 1Ω	† 8. 8KΩ	† 3. 9KΩ	. 2Ω		
V 9	6CL6	500Ω	470ΣΩ	† 1. 2KΩ	. 1Ω	0Ω	† 4KΩ	0Ω	† 1. 2KΩ	470KΩ
V 10	6AU6	† 2. 2KΩ	† 1. 2KΩ	0Ω	. 1Ω	475KΩ	† 210Ω	† 1. 2KΩ		
V 11	6AU6	2Ω	0Ω	0Ω	. 1Ω	† 2. 2KΩ	† 2. 2KΩ	68Ω		
V 12	6AU6	56KΩ	0Ω	0Ω	. 1Ω	† 2. 2KΩ	† 34. 2KΩ	0Ω		
V 13	6AL5	INF.	INF.	0Ω	. 1Ω	10KΩ	0Ω	10KΩ		
V 14	6CS6	40KΩ	0Ω	0Ω	. 1Ω	† 390KΩ	† 19KΩ	1. 5Meg		
V 15	6AV0	10 Meg	0Ω	. 1Ω	0Ω	900KΩ	900KΩ	† 515KΩ		
V 16	6AQ5	470KΩ	330Ω	. 1Ω	0Ω	† 1. 6KΩ	† 1. 2KΩ	470KΩ		
V 17	6SN7GT	2. 5Meg	● 1. 8Meg	162Ω	† 390KΩ	† 14. 5KΩ	3. 3KΩ	. 1Ω	0Ω	
V 18	6S4	INF.	3. 5KΩ	1. 8Meg	0Ω	. 1Ω	1. 8Meg	INF.	INF.	● 5. 5KΩ
V 19	6SN7GT	1. 5Meg	† 80KΩ	410KΩ	480KΩ	† 120KΩ	0Ω	. 1Ω	0Ω	
V 20	6CD6G	470KΩ	0Ω	150Ω	† 10KΩ	470KΩ	INF.	. 1Ω	† 10KΩ	TOP CAP ● 19Ω
V 21	6AX4GT	† 50Ω	INF.	0Ω0KΩ	INF.	† 55Ω	INF.	. 1Ω	0Ω	
V 22	1B3GT				PINS 1-8 HAVE INF.		RESISTANCE			TOP CAP ● 469Ω
V 23	5U4G	INF.	7KΩ.	INF.	12Ω	INF.	14Ω	0Ω	7KΩ	
V 24	5U4G	INF.	7KΩ	INF.	12Ω	INF.	14Ω	INF.	7KΩ	
V 25	21ZP4B	. 1Ω	1. 2Meg	PIN 10 ●200KΩ	PIN 11 † 160KΩ	PIN 12 0Ω				

† MEASURED FROM PIN 2 OF V24.
▲ MEASURED IN UHF POSITION.
● MEASURED FROM PIN 3 OF V21.



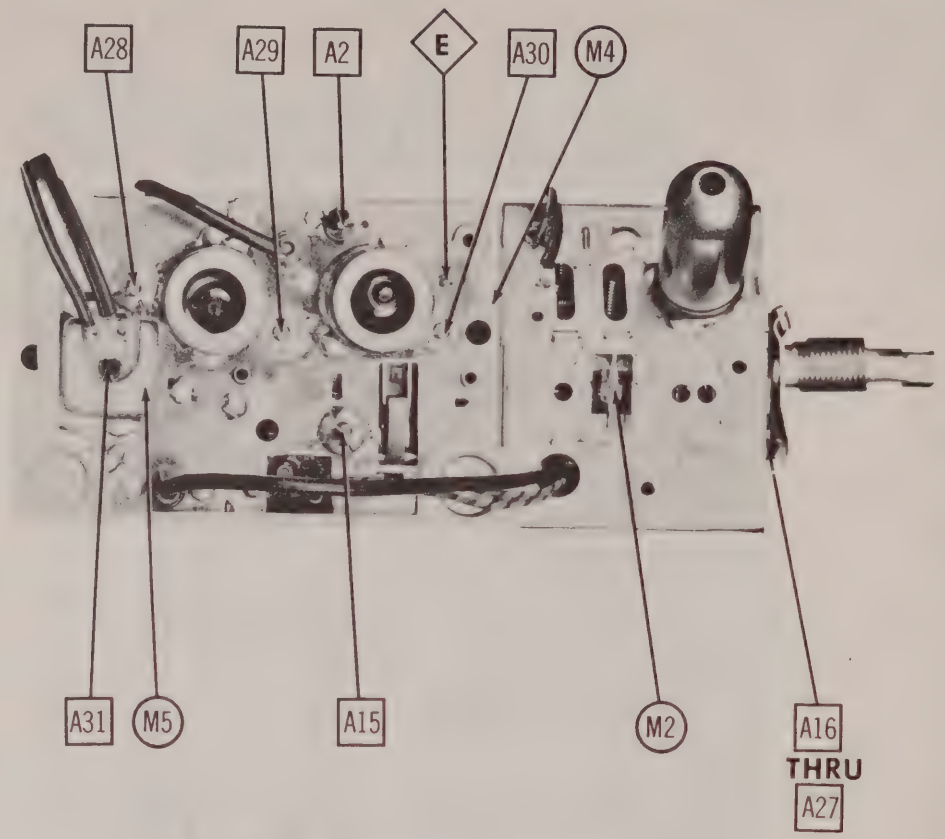
BOTTOM VIEW



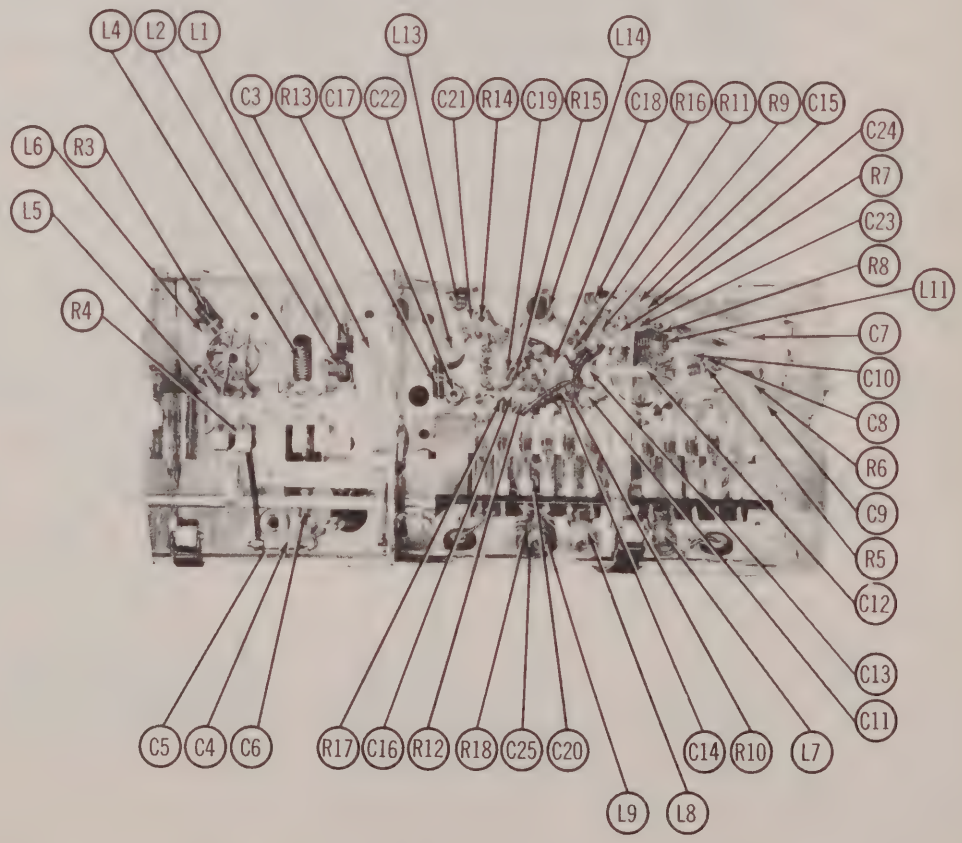
TUBE PLACEMENT CHART

PROPERTY OF
L. F. BLANKENSHIP
3934 MEADE ST.
DENVER, COLORADO

SWEEP CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION

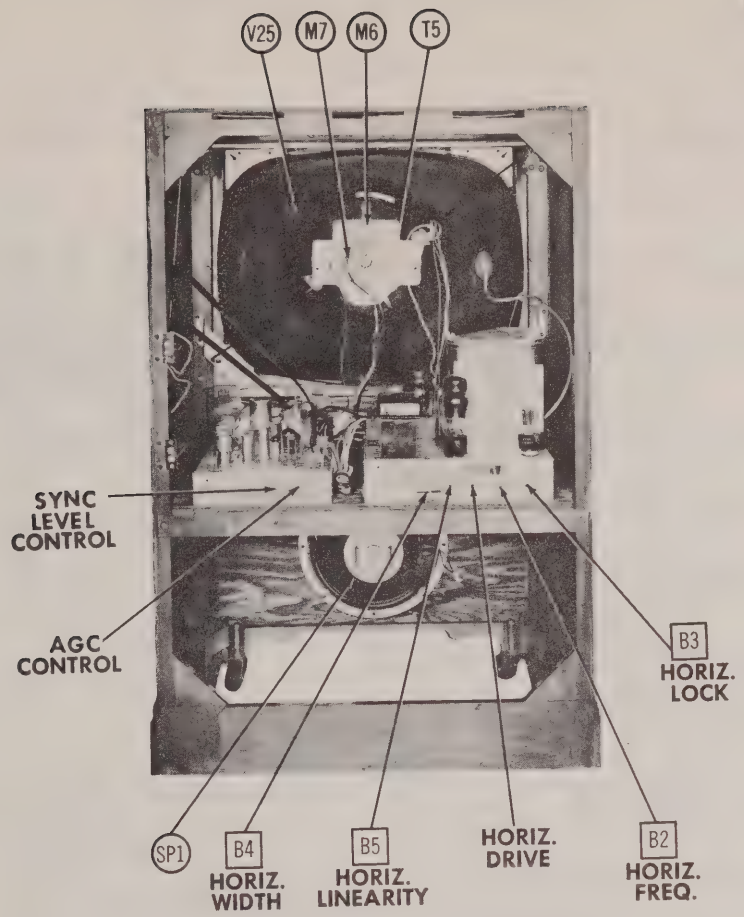


RF TUNER-TOP VIEW



RF TUNER-BOTTOM VIEW

PROPERTY OF
L. F. BLANKENSHIP
3081 MEADE ST.
DENVER, COLORADO



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

HORIZONTAL FREQUENCY ADJUSTMENT
Turn the horizontal hold control fully clockwise.
Adjust the horizontal frequency slug (B1) until the picture is just ready to lose sync. If necessary, slightly readjust the horizontal locking range trimmer (B3) to obtain this condition.

HORIZONTAL WAVEFORM ADJUSTMENT
Connect the vertical amplifier of an oscilloscope through a 10MMF capacitor to terminal "C" of L34.
Adjust the horizontal waveform slug (B2) for a waveform similar to Fig. 8. If necessary, keep picture in sync by turning horizontal hold control counter clockwise.

HORIZONTAL LOCKING RANGE ADJUSTMENT
Turn the horizontal hold control fully counter clockwise then switch off channel and back again. Slowly turn the horizontal hold control in a clockwise direction until picture just pulls into sync. If more than 3 diagonal bars were present just before picture pulled into sync adjust B3 slightly clockwise. If less than 2 bars were present adjust B3 slightly counter clockwise. Turn the horizontal hold control counter clockwise and switch off channel and back again and recheck number of bars before picture pulls into sync. Repeat procedure until 2 to 3 bars are present just before picture pulls into sync.
The horizontal holding action should now be as follows:

(a) Turn horizontal hold control fully counter clockwise. The picture should remain in sync.
(b) Switch off channel and back again. Picture may be out of sync.
(c) Turn horizontal hold control slowly clockwise and note number of bars just before picture pulls into sync. Two to three bars should be present.
(d) Turn horizontal hold control fully clockwise. Picture should be just ready to pull out of sync.

If necessary repeat "Horizontal frequency Adjustment" and "Horizontal Locking range Adjustment" until proper horizontal holding action as outlined above is obtained.
Adjust the horizontal drive control clockwise as far as possible without the presence of vertical white lines or compression near the center of the picture.
Adjust the horizontal width slug (B4) for a picture slightly wider than necessary to fill the picture mask horizontally.
Adjust the horizontal linearity slug (B5) for a picture that is symmetrical from left to right.

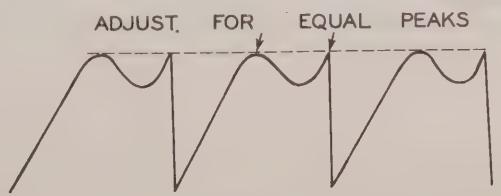


FIG. 8

TROUBLE SHOOTING AIDS

SWEEP

HORIZONTAL

LOSS OF SWEEP

Follow procedure outlined under "Loss of High Voltage".

INSUFFICIENT SWEEP

Check by substitution V20, and V21. Check R115, R114, R112, T3, T5A, and C66. Check adjustments R69 and B4.

DRIVE LINES

Check by substitution V20 and V21. Check C99, R114, R115, T3 and T5A and other associated components.

COMPRESSED LEFT SIDE

Check by substitution V20 and V21 and check horizontal output and damper stages for component failure or change of value. Check T3 and T5A.

FOLDS

Follow procedure outlined under "Drive Lines".

PIE CRUST EFFECT

Check by substitution V19, V20 and V21. Check C93 for open. Check L34, R102, R105, C97 and other associated components.

XMAS TREE EFFECT

Check by substitution V19, V20 and V21. Check L34, R102, R100, C96, C98 and C99 and other associated components.

VERTICAL

LOSS OF SWEEP

Check by substitution V17 and V18. Check wave form W11.

If Satisfactory	If Unsatisfactory
Check T4, T5B, C64, C65, R84, R64 and other associated components.	Check T2, R79, R82, R67, C82, C81 and other associated components.

INSUFFICIENT SWEEP

Check by substitution V17, V18. Check height and vertical linearity controls for proper adjustment. Check T4 and T5B.

COMPRESSED AT BOTTOM

Check by substitution V17, and V18. Check R67, R79, C81, T2 and other associated components.

COMPRESSED AT TOP

Check by substitution V17 and V18. Check R84, R64, C62, C65 and other associated components.

FOLDS

Check by substitution V17 and V18. Check C79, R82, C80, C82 and other associated components.

SYNC

LOSS OF VERTICAL AND HORIZONTAL SYNC

Check by substitution V14 and V17. Check C57, C61, R60 R61, R96, R97 and other associated components.

LOSS OF VERTICAL SYNC- HORIZONTAL SYNC SATISFACTORY

Substitute V17. Check wave form W8.

If Satisfactory	If Unsatisfactory
Check T2, C78, C76, C77, R68, R78 and other associated components.	Check vertical integrator network. Check video IF alignment for overloading.

LOSS OF HORIZONTAL SYNC-VERTICAL SYNC SATISFACTORY

Check by substitution V19. Check C88 if used in set. Check C89, R105, R63, R104, R101 and other associated components.

HORIZONTAL BENDING

Check by substitution V14, V17 and V19. Check horizontal AFC network.

VIDEO

LOSS OF VIDEO

Check by substitution V8 and V9. Check C42; C43, C1A, R34, R35, L27, L28, L30 and other associated components.

SOUND BARS (4.5MC BEAT)

Adjust tuner fine tuning for best sound and picture. Check video IF alignment. Check adjustment A9.

POOR CONTRAST

Check by substitution T8 and T9. Check contrast control, picture tube, R37, L27, L24 and other associated components.

NEGATIVE PICTURE

Check by substitution V8 and V9. Check picture tube. Check video detector network. Check L27, C43 and other associated components.

SMEAR

Check by sbustitution V8 and V9. Check L24, L25, L27, C43 . Check AGC network and other associated compontents.

WIDE BLACK BAR ACROSS PICTURE

Check by substitution V2, V4, V5, V6, V7, V8 and V9 for heater to cathode leakage.

AUDIO

WEAK OR NO SOUND

Check by substitution V11, V12, V13, V15 and V16. Check stages V15 and V16 using audio signal generator. Apply audio signal across R62B.

If Satisfactory	If Unsatisfactory
Check ratio detector and audio IF for component failure or change of value.	Check C67, C69 C72, C74, R75, R72, T8, speaker and other associated components.

BUZZ

Adjust tuner fine tuning for best sound and picture. Check adjustment A14 for minimum buzz. If still unsatisfactory check audio IF alignment.

DISTORTED

Follow procedure outlined under "Weak or No Sound".

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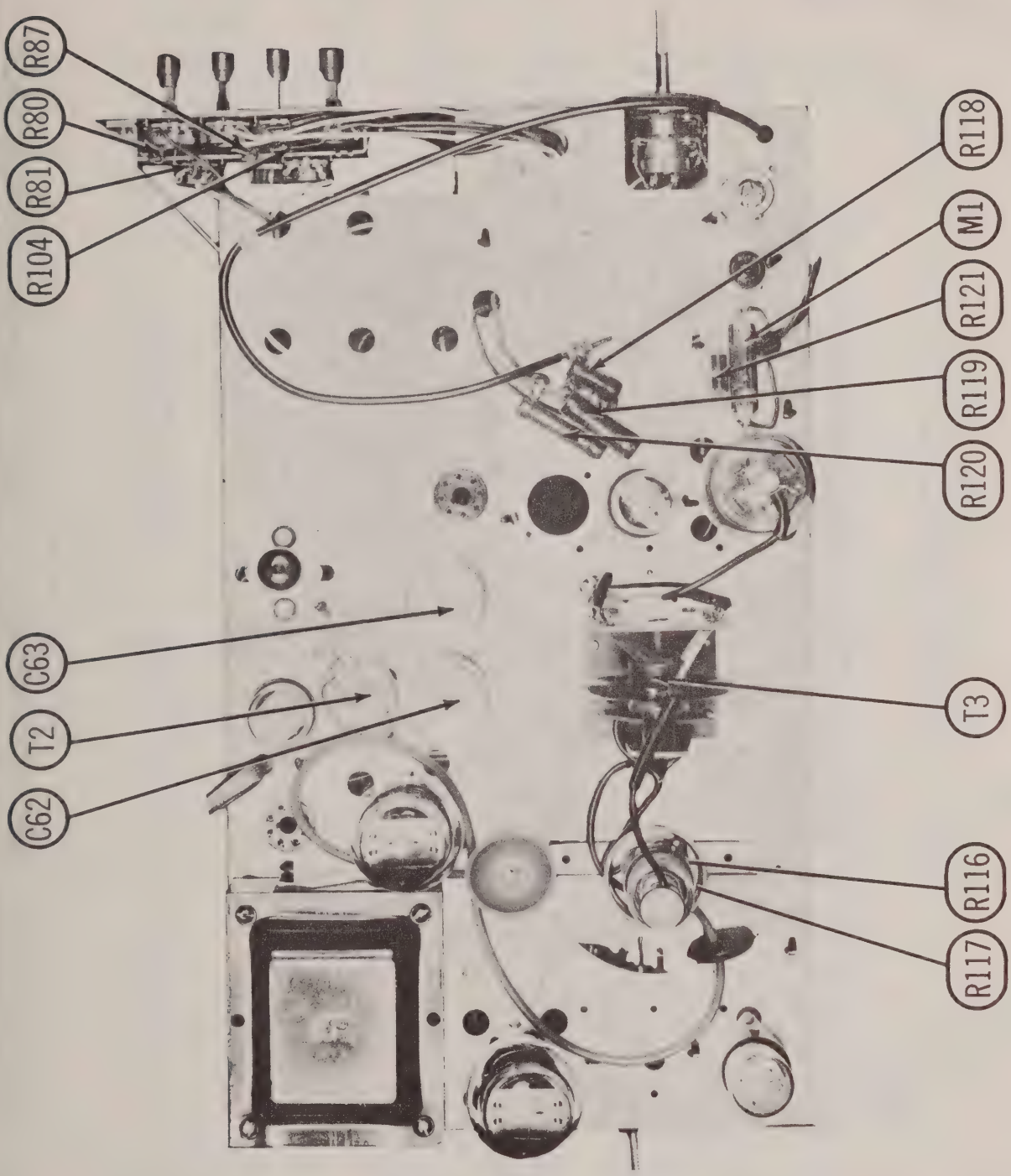
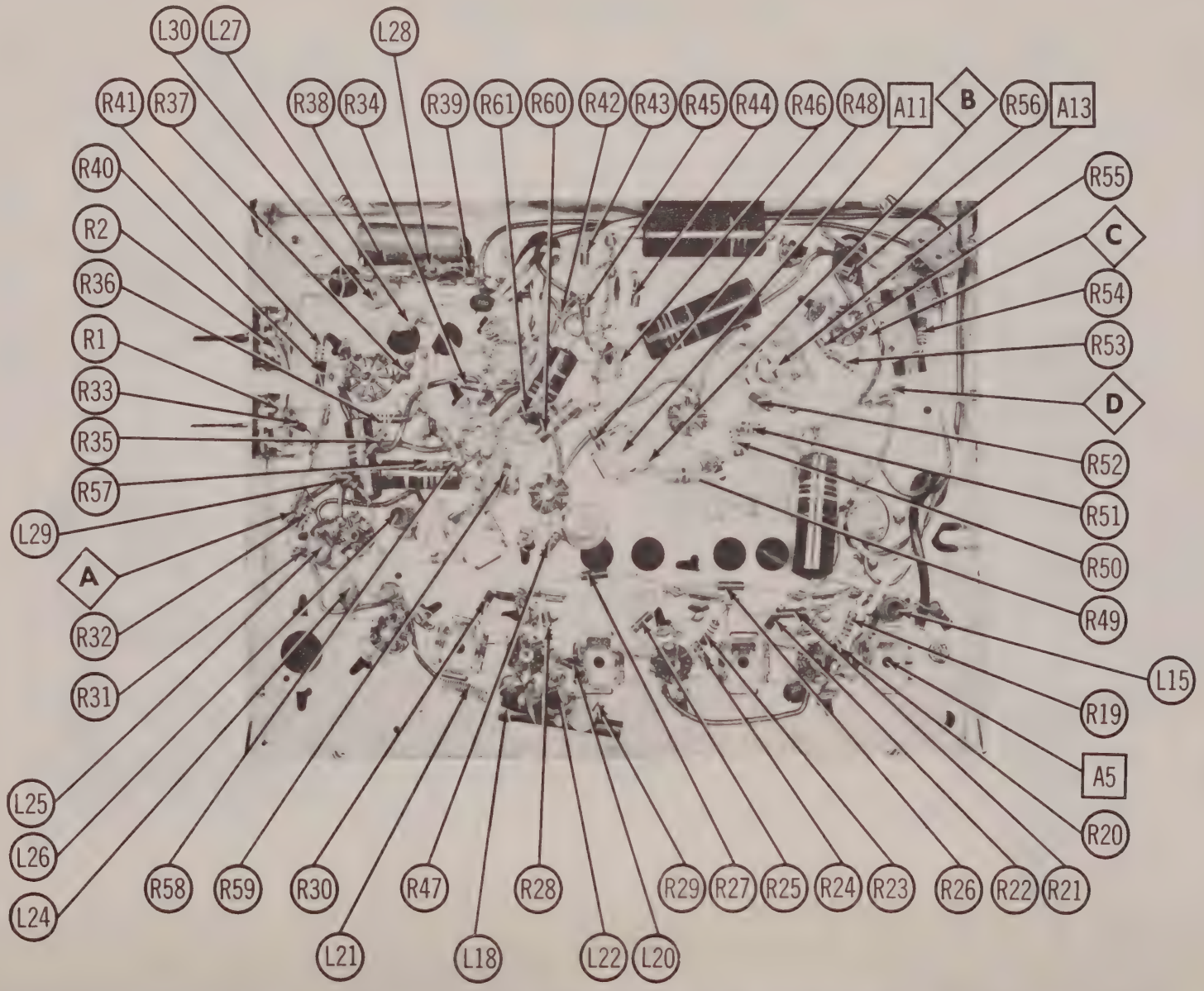
L. F. BLANKENSHIP



SWEEP CHASSIS-TOP VIEW



RF-IF CHASSIS-BOTTOM VIEW-RESISTOR INDUCTOR AND ALIGNMENT IDENTIFICATION

PROPERTY
L. F. BLANKENSHIP

PARTS LIST AND DESCRIPTIONS

RF-IF CHASSIS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		Wells-Gardner PART No.	STANDARD REPLACEMENT		
V1	UHF Oscillator	6AF4	6AF4	7DK	
V2	VHF RF Amp.	6BZ7	6BZ7	9AJ	
V3	VHF Converter	6U8	6U8	9AE	
V4	1st. Video IF Amp.	6CB6	6CB6	7CM	
V5	2nd. Video IF Amp.	6CB6	6CB6	7CM	
V6	3rd. Video IF Amp.	6CB6	6CB6	7CM	
V7	Video Detector-DC Restorer	6AL5	6AL5	6BT	
V8	Video Amp.	6AU6	6AU6	7BK	
V9	Video Output	6CL6	6CL6	6CL6	
V10	AGC Keying	6AU6	6AU6	7BK	
V11	1st. Sound IF Amp.	6AU6	6AU6	7BK	
V12	2nd. Sound IF Amp.	6AU6	6AU6	7BK	
V13	Ratio Detector	6AL5	6AL5	6BT	
V14	Sync Separator	6CS6	6CS6	7CH	When the rear of the chassis is not marked with red paint, a 6BE6 is then used in this application.

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA Wells-Gardner PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	▲30	350	45X408	AFH3-39		C030		FP428	TVL-3782	
B	▲60	350								
C2	5	25	47X378	PRS150/4		BR550		TC30	TVA-1203	
C3A	1									
B	2									
C4	800			EF-001	MFT-1000				503C-D1	
C5	800			EF-001	MFT-1000				503C-D1	
C6	10									
C7	6.8			SI6.8NP0	TCZ-6.8	Z013	NP0K-6R8	ZT-5568	5TCCB-V68	
C8	.5-3				829-3		3115-01-0R5	CT565A		
C9	1500			BPD-0015	DD-152	K071	801-0015	DC-5215	5HK-D15	
C10	3			SI3NP0	TCZ-3	Z007	NP0K-030	ZT-5533	5TCCB-V33	
C11	.5-3				829-3		3115-01-0R5	CT565A		
C12	800			EF-001	MFT-1000				503C-D1	
C13	1.5			SI1.5NP0	TCZ-1.5	Z004	NP0K-1R5	ZT-5515	5TCCB-V15	
C14	47			BPD-000047	D6-470	G033	801-470	UC-5447	5GA-Q47	
C15	800			EF-001	MFT-1000				503C-D1	
C16	47									
C17	.5-3				829-3		3115-01-0R5	CT565A		
C18	10			SI10N750	TCN-10	N018	N750K-100	NT-541	5TCU-Q1	
C19	5									
C20	.5-3				829-3		3115-01-0R5	CT565A		
C21	1500			BPD-0015	DD-152	K071	801-0015	DC-5215	5HK-D15	
C22	220			BPD-00022	D6-221	G051	GP2K-221	UC-5322	5GA-T22	
C23	800			EF-001	MFT-1000				503C-D1	
C24	800			EF-001	MFT-1000				503C-D1	
C25	1500			BPD-0015	DD-152	K071	801-0015	DC-5215	5HK-D15	
C26	36		47X626							
C27	47		47X603	SI47	D6-470	G033	GP1K-470	UC-5447	5GA-Q47	
C28A	1000		80X3	BPD-2X001	DD2-102	DK069	812-001	DCD-521	5HK-2D1	
B	1000									
C29	680		80X5	BPD-00068	D6-681	K065	GP2K-681	UC-5368	5GA-T68	
C30	1000		80X1	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C31A	1000		80X3	BPD-2X001	DD2-102	DK069	812-001	DCD-521	5HK-2D1	
B	1000									
C32	680		80X5	BPD-00068	D6-681	K065	GP2K-681	UC-5368	5GA-T68	
C33	1		47X588	SI1NP0	TCZ-1	TZ03	NP0K-010		5TCCB-V1	
C34	150		RCM15E151K	1469-00015		22R5T15		MCB236		
C35	470		80X4	BPD-00047	D6-471	K060	GP2K-471	UC-5347	5GA-T47	
C36	470		80X4	BPD-00047	D6-471	K060	GP2K-471	UC-5347	5GA-T47	
C37	1000		80X1	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C38	1000		80X1	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C39	1000		80X1	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C40	5		47X562	SI5NP0	TCZ-4.7	TZ07	NP0K-050	ZT-555	5TCCB-V47	
C41	510	500				5R5T51				
C42	.047	400	RCP10M4473M	P488-047	DF-503	CUB4S47		PT4147	4TM-S47	
C43	.1	400	RCP10M4104M	P488-1	DF-104	CUB4P1		PT401	4TM-P1	
C44	1000		80X1	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	Note 1
C45	1000		80X1	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	Note 2
C46	.22	200	RCP10M2224M	P488-22		CUB4P22		PT4022	4TM-P22	
C47	.22	200	RCP10M2224M	P488-22		CUB4P22		PT4022	4TM-P22	
C48	.47	200	RCP10M2474M	P288-47		CUB2P47		PT4047	2TM-P47	Note 3
C49	1000		80X1	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	Note 1
C50	1.5		47X584	SI1.5NP0	TCZ-1.5	TZ0	NP0K-1R5	ZT-5515	5TCCB-V15	
C51A	10000		80X6	BPD-2X01	DD3-103	DK082	811-01	DC-511	5HK-2S1	
B	10000						811-01	DC-511		
C52	100		47X604	SI100	D6-101	TP34	GP1K-101	UC-531	5GA-T1	
C53	5000		47X507	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C54	5000		47X507	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C55	330	500	47X570	1469-00035		5R5T33				
C56	470	500	RCM20B471K	1469-0005		5R5T47		MCB245	MS-35	
C57	.047	400	RCP10M4473M	P488-047	DF-503	CUB4S47		PT4147	4TM-S47	Note 4
C58	330	500	47X570	1469-00035		5R5T33				Note 1
C59	100		47X604	SI100N750	TCN-100	TN22	N750K-100	NT-531	5TCU-T1	Note 1
C60	1000		80X1	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C61	.047	400	RCP10M4473M	P488-047	DF-503	CUB4S47		PT4147	4TM-S47	

Note 1. Used in chassis with red paint mark on rear of chassis.
Note 2. Chassis with orange paint mark on rear use 4MFD in this application.
Note 3. Used in chassis with orange paint mark on rear of chassis.
Note 4. Chassis not marked with red paint on rear use .01MFD in this application.

PROPERTY OF

PARTS LIST AND DESCRIPTIONS (Continued)

CONTROLS

ITEM No	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA Wells-Gardner PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	7 .5Meg	½	B40X370A	Q11-142	A47-7.5Meg-S	AB-59	U-53	Sync level
B	Shaft		Not Req.	Not Req.	FS2-1/4	AK-4		Attach to R1A
R2A	2. 5Meg	½	B40X380A	Q11-330	A47-2.5Meg-S	AB-53	8U565	AGC
B	Shaft		Not Req.	BQ	FS3-1/4	AK-4	Not Req.	Attach to R2A

RESISTORS

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA Wells-Gardner PART No.	IRC PART No.	NOTES
R3	10KΩ	½		BTS-10K	
R4	100Ω	½		BTS-100	
R5	22KΩ	½		BTS-22K	
R6	47KΩ	½		BTS-47K	
R7	270KΩ	½		BTS-270K	
R8	180KΩ	½		BTS-180K	
R9	68Ω	½		BTS-680	
R10	33KΩ	½		BTS-33K	
R11	3300Ω	½		BTA-3300	
R13	15KΩ	½		BTS-15K	
R15	100KΩ	½		BTS-100K	
R14	100KΩ	½		BTS-100K	
R15	100KΩ	½		BTS-100K	
R16	8200Ω	½		BTS-8200	
R17	10KΩ	½		BTS-10K	
R18	47000Ω	½		BTS-4700	
R19	33000Ω 5%	½	B83332	BTS-3300 5%	
R20	470.5%	½	B83470	BTS-47 5%	
R21	1000Ω	½	B84103	BTS-1000	
R23	470Ω	½	B8547I	BTS-470	
R23	39KΩ 5%	½	B83393	BTS-39K 5%	
R24	47Ω 5%	½	B83470	BTS-47 5%	
R25	470Ω	½	B8547I	BTS-470	
R26	100Ω	½	B85101	BTS-100	
R27	150Ω	½	B85151	BTS-150	
R28	39KΩ 5%	½	B83393	BTS-39K 5%	
R29	180Ω	½	B84181	BTS-180	
R30	1500Ω	½	B84152	BTS-1500	
R31	39000Ω 5%	½	B83392	BTS-3900 5%	
R32	47KΩ	½	B84473	BTS-47K	
R33	27000Ω 5%	½	B83272	BTS-2700 5%	
R34	1000Ω	½	B84102	BTS-1000	
R35	5800Ω	½	B84582	BTS-5800	
R36	470KΩ	½	B84474	BTS-470K	
R37	100Ω	½	B84101	BTS-100	
R38	20000Ω 5%	2	D83202		
R39	20000Ω 5%	2	D83202		
R40	1 Meg	½	B84105	BTS-1 Meg	
R41	68KΩ	½	B84683	BTS-68K	
R42	47KΩ	½	B84473	BTS-47K	
R43	330KΩ	½	B84334	BTS-330K	
R44	100KΩ	½	B84104	BTS-100K	
R45	470KΩ	½	B84474	BTS-470K	
R46	3. 3Meg	½	B84335	BTS-3. 3Meg	
R47	68Ω	½		BTS-68	Note 1
R48	1000Ω	½	B85102	BTS-1000	
R49	56KΩ	½	B84563	BTS-56K	
R50	33KΩ	½	B84333	BTS-33K	
R51	33KΩ	½	B84333	BTS-33K	
R52	1000Ω	½	B85102	BTS-1000	
R53	270Ω	½	B84271	BTS-270	
R54	68KΩ	½	B84683	BTS-68K	
R55	10KΩ 5%	½	B83103	BTS-10K	
R58	10KΩ 5%	½	B83103	BTS-10K	
R57	150KΩ	½	B84154	BTS-150K	
R58	1. 5Meg	½	B84155	BTA-1. 5Meg	
R59	150KΩ	½	B84154	BTS-150K	
R60	18KΩ	½	C16483	BTA-18K	
R61	390KΩ	½	B84394	BTS-390K	

Note 1. Some models may use a 100 Ω resistor in this application.

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI	DC RES. SEC	REPLACEMENT DATA Wells-Gardner PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	UHF Ant. Coil	0Ω						
L2	UHF Ant. Coil	0Ω						
L3A	UHF Ant., Mixer, Osc. Coils	0Ω		9A2331-10				Channels 10 thru 19
B	UHF Ant., Mixer, Osc. Coils	0Ω		9A2331-20				Channels 20 thru 29
C	UHF Ant., Mixer, Osc. Coils	0Ω		9A2331-30				Channels 30 thru 39
D	UHF Ant., Mixer, Osc. Coils	0Ω		9A2331-40				Channels 40 thru 49
E	UHF Ant., Mixer, Osc. Coils	0Ω		9A2331-50				Channels 50 thru 59
F	UHF Ant., Mixer, Osc. Coils	0Ω		9A2331-60				Channels 60 thru 69
G	UHF Ant., Mixer, Osc. Coils	0Ω		9A2331-70				Channels 70 thru 79
H	UHF Ant., Mixer, Osc. Coils	0Ω		9A2331-80				Channels 80 thru 83
L4	RF Choke	0Ω						
L5A	Fil. Choke	0Ω						
B	Fil. Choke	0Ω						
L6	Cathode Choke	0Ω						
L7	UHF IF Input Coil	0Ω	.5Ω					
L8	UHF IF Interstage	.3Ω	.1Ω					
L9	UHF IF Interstage	.3Ω						
L10A	VHF Ant. Coil	0Ω		9A2329-2				Channel 2
B	VHF Ant. Coil	0Ω		9A2329-3				Channel 3
C	VHF Ant. Coil	0Ω		9A2329-4				Channel 4
D	VHF Ant. Coil	0Ω		9A2329-5				Channel 5
E	VHF Ant. Coil	0Ω		9A2329-6				Channel 6
F	VHF Ant. Coil	0Ω		9A2329-7				Channel 7
G	VHF Ant. Coil	0Ω		9A2329-8				Channel 8
H	VHF Ant. Coil	0Ω		9A2329-9				Channel 9
I	VHF Ant. Coil	0Ω		9A2329-10				Channel 10
J	VHF Ant. Coil	0Ω		9A2329-11				Channel 11
K	VHF Ant. Coil	0Ω		9A2329-12				Channel 12
L	VHF Ant. Coil	0Ω		9A2329-13				Channel 13
L11	Neut. Coil	0Ω						
L12A	RF, Mixer Grid, Osc. Coil	0Ω		9A2330-2				Channel 2
B	RF, Mixer Grid, Osc. Coil	0Ω		9A2330-3				Channel 3
C	RF, Mixer Grid, Osc. Coil	0Ω		9A2330-4				Channel 4
D	RF, Mixer Grid, Osc. Coil	0Ω		9A2330-5				Channel 5
E	RF, Mixer Grid, Osc. Coil	0Ω		9A2330-6				Channel 6
F	RF, Mixer Grid, Osc. Coil	0Ω		9A2330-7				Channel 7
G	RF, Mixer Grid, Osc. Coil	0Ω		9A2330-8				Channel 8
H	RF, Mixer Grid, Osc. Coil	0Ω		9A2330-9				Channel 9
I	RF, Mixer Grid, Osc. Coil	0Ω		9A2330-10				Channel 10
J	RF, Mixer Grid, Osc. Coil	0Ω		9A2330-11				Channel 11
K	RF, Mixer Grid, Osc. Coil	0Ω		9A2330-12				Channel 12
L	RF, Mixer Grid, Osc. Coil	0Ω		9A2330-13				Channel 13
L13	Fil. Choke	0Ω						
L14	Conv. Plate	.1Ω		31K264				
L15	IF trap	.1Ω		9A2320				
L16	1st. Video IF	.1Ω		9A2316				
L17	2nd. Video IF	.1Ω	.1Ω	9A2317			6218	Includes 47.25MC trap
L18	Fil. Choke	0Ω		9A2323	19-1003		4606	3.3 Microhenries
L19	3rd. Video IF	.1Ω	.1Ω	9A2318			6233 *	
L20	Parasitic Suppressor	0Ω		9A2322				2 turns wire on 10KΩ resistor
L21	Fil. Choke	0Ω		9A2083	19-1003		4606	3.3 Microhenries
L22	Cathode Trap	0Ω	0Ω	9A2321				
L23	4th. Video IF	.5Ω	.5Ω	9A2319			6234	
L24	Series Peaking Coil	1Ω		36A21	19-4121 ▲		6153	130 Microhenries; wound on 6.8KΩ resistor
L25	Shunt Peaking Coil	17Ω		36A22	19-3300	TV-185	6155	290 Microhenries
L26	4.5MC Trap	.2Ω		9A3076	20-1004	TV-151	1470	
L27	Series Peaking Coil	1Ω		36A17	19-3160 ■	TV-184 ■	6153 ■	147 Microhenries; wound on 15KΩ resistor
L28	Shunt Peaking Coil	13Ω		36A17	19-3160	TV-184	6153	165 Microhenries
L29	Shunt Peaking Coil	7Ω		36A10	19-4080		6172	60 Microhenries
L30	Shunt Peaking Coil	10Ω		36A19	19-3100 †		6153 †	130 Microhenries; wound on 220Ω resistor
L31	1st Sound IF	2Ω		9A2201	LT-1031 ▲	TV-113 ♦	6203 ♦	
L32	2nd Sound IF	2. 5Ω	2Ω	9A2323	LT-1021 ▲	TV-113	6303	
L33	Ratio Det.	3. 7Ω	.61CT	9A2395	LT-3497	TV-115	6205	

* Detune trap.
■ Parallel with 15KΩ resistor.
▲ Wound on 8. 2KΩ resistor.
† Parallel with 220Ω resistor.
♦ Drill mounting holes.
• Use one winding.

COILS (cont)

ITEM No.	USE	DC RES. PRI	DC RES. SEC	REPLACEMENT DATA Wells-Gardner PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
D	RF, Mixer Grid, Osc. Coil	0Ω		9A2330-5				Channel 5
E	RF, Mixer Grid, Osc. Coil	0Ω		9A2330-6				Channel 6
F	RF, Mixer Grid, Osc. Coil	0Ω		9A2330-7				Channel 7
G	RF, Mixer Grid, Osc. Coil	0Ω		9A2330-8				Channel 8
H	RF, Mixer Grid, Osc. Coil	0Ω		9A2330-9				Channel 9
I	RF, Mixer Grid, Osc. Coil	0Ω		9A2330-10				Channel 10
J	RF, Mixer Grid, Osc. Coil	0Ω		9A2330-11				Channel 11
K	RF, Mixer Grid, Osc. Coil	0Ω		9A2330-12				Channel 12
L	RF, Mixer Grid, Osc. Coil	0Ω		9A2330-13				Channel 13
L13	Fil. Choke	0Ω						
L14	Conv. Plate	.1Ω		31K264				
L15	IF trap	.1Ω		9A2320				
L16	1st. Video IF	.1Ω		9A2316				
L17	2nd. Video IF	.1Ω	.1Ω	9A2317			6218	Includes 47.25MC trap
L18	Fil. Choke	0Ω		9A2323	19-1003		4606	3.3 Microhenries
L19	3rd. Video IF	.1Ω	.1Ω	9A2318			6233 *	
L20	Parasitic Suppressor	0Ω		9A2322				2 turns wire on 10KΩ resistor
L21	Fil. Choke	0Ω		9A2083	19-1003		4606	3.3 Microhenries
L22	Cathode Trap	0Ω	0Ω	9A2321				
L23	4th. Video IF	.5Ω	.5Ω	9A2319			6234	
L24	Series Peaking Coil	1Ω		36A21	19-4121 ▲		6153	130 Microhenries; wound on 6.8KΩ resistor
L25	Shunt Peaking Coil	17Ω		36A22	19-3300	TV-185	6155	290 Microhenries
L26	4.5MC Trap	.2Ω		9A3076	20-1004	TV-151	1470	
L27	Series Peaking Coil	1Ω		36A17	19-3160 ■	TV-184 ■	6153 ■	147 Microhenries; wound on 15KΩ resistor
L28	Shunt Peaking Coil	13Ω		36A17	19-3160	TV-184	6153	165 Microhenries
L29	Shunt Peaking Coil	7Ω		36A10	19-4080		6172	60 Microhenries
L30	Shunt Peaking Coil	10Ω		36A19	19-3100 †		6153 †	130 Microhenries; wound on 220Ω resistor
L31	1st Sound IF	2Ω		9A2201	LT-1031 ▲	TV-113 ♦	6203 ♦	
L32	2nd Sound IF	2. 5Ω	2Ω	9A2323	LT-1021 ▲	TV-113	6303	
L33	Ratio Det.	3. 7Ω	.61CT	9A2395	LT-3497	TV-115	6205	

* Detune trap.
■ Parallel with 15KΩ resistor.
▲ Wound on 8. 2KΩ resistor.
† Parallel with 220Ω resistor.
♦ Drill mounting holes.
• Use one winding.

CRYSTAL DIODES

ITEM No.	OBIG-TYPE	REPLACEMENT DATA Wells-Gardner PART No.	SYLVANIA PART No.	FEDERAL PART No.	NOTES
M3	1N82		1N82 or 1N82A	1N72A	UHF Mixer

MISCELLANEOUS

ITEM No.	PART NAME	Wells-Gardner PART No.	NOTES
M3	Dial Light	TA32	#51, Bayonet
M4	Tuner	25A1112	VHF-UHF
M5	Trap	31K-228	IF waveform- UHF Ant. Input

SWEEP CHASSIS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No	USE	REPLACEMENT DATA Wells-Gardner PART No.	STANDARD REPLACEMENT	RETMA BASE TYPE	NOTES
V15	Audio Amplifier-AGC Clamper	6AV6	6AV6	7BT	
V16	Audio Output	6AQ5	6AQ5	7BZ	
V17	Sync Amp.-Vert. Osc.	6SN7GT	6SN7GT	8TD	
V18	Vert. Output	6S4	6S4	9AC	
V19	Horiz. AFC-Horiz. Osc.	6SN7GT	6SN7GT	8TD	
V20	Horiz. Output	6L D6G	6CD6G	3BT	
V21	Damper	6AX4GT	6AX4GT	6CG	
V22	HV Rectifier	1B3GT	1B3GT	3C	
V23	LV Rectifier	5U4G	5U4G	5T	
V24	LV Rectifier	5U4G	5U4G	5T	

CATHODE-RAY TUBE

ITEM No	REPLACEMENT DATA Wells-Gardner PART No.	CBS-HYTRON PART No.	GENERAL ELECTRIC PART No.	SYLVANIA PART No.	WESTINGHOUSE PART No	RETMA BASE TYPE	NOTES
V25	21ZP4B	21ZP4B	21ZP4B	21ZP4B 21ZP4A 21ZP4 ①	21ZP4B	12N 12N 12G	① Circuit changes necessary.

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No	RATING CAP.	RATING VOLT	REPLACEMENT DATA Wells-Gardner PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No	MALLORY PART No.	SPRAGUE PART No	NOTES
C62A	.02	350	47X409	AFH-87		D066		FP245	TVL-4747	
B	.01	350						TC3501		
C	.100	50								
C63A	.02	350	47X407	AFH-84		D065		FP245	TVL-4745	
B	.01	350						TC42		
C	.10	50								Note 5
C64	30	400	45X393	PRH450/30		BH3045		TC77	TVA-1711	
C65	30	400	45X393	PRH450/30		BH3045		TC77	TVA-1711	
C66	5	25	47X378	PRH150/4		BH550		TC80	TVA-1303	
C67	.047	200	RCP10M47S3M	P388-047	DF-503	CUB3847		PT6147	37M-D47	
C68	.0047	400	RCP10M4G73M	P668-0047		CUB6D47	GP2-333-472	PT6347	67M-D47	
C69	5000	600	47X507	BPD-005	DD-502	K060	81L-005	DC-535	5HK-D5	
C70	100	500	47X504	BPD-01	D6-101		GP2K-1S1	DC-511	5GA-T1	
C71	.22	400	RCP10M4S34M	P488-32		CUB4P33			PT4P32	4TM-P32
C72A	.01	250	↑TK3	↑PA-113-3	↑PC-80	↑1137M1	↑1604-01		↑T-1	
C	.250									
C73	.01	400	RCP10M3S103M	P488-01	D6-103	CUB4S1	GP2-333-103	PT411	4TM-S1	
C74	.0047	600	RCP10M6473M	P688-0047	D6-473	CUB6D47	GP2-333-473	PT6347	67M-D47	
C75A	.022		↑7EX7	↑PA-110	↑PC-100	↑1157M1	↑1606-01	PT623	↑V-1	
B	.005							PT625		
C	.005							PT525		
C76	4700	500	RCM30B472J	1654-005		BS1D47			MS-35	
C77	470	500	RCM20B471K	1669-0005		SR5747			MS-35	
C78	.01	400	RCP10M3103M	P488-01	D6-103	CUB4S1	GP2-333-103	PT411	4TM-S1	
C79	.047	600	RCP10M6473M	P688-0047	D6-473	CUB6D47		PT6347	67M-D47	
C80	.047	200	RCP10M2473M	P288-047	DF-503	CUB2847		PT6147	37M-D47	
C81	.047	600	RCP10M6473M	P688-047	DF-503	CUB6847		PT6147	67M-D47	
C82	.01	600	RCP10M6103M	P688-01	DF-104	CUB6P1		PT601	67M-P1	
C83	.047	600	RCP10M6473M	P688-047	DF-503	CUB6847		PT6147	67M-S47	
C84	.015	600	RCP10M6153M	P688-015		CUB6S15		PT6315	67M-S15	
C85	.1	200	RCP10M2104M	P288-1	DF-104	CUB2P1		PT601	37M-P1	
C86	.1	600	RCP10M6104M	P688-1	DF-104	CUB6P1		PT601	67M-P1	
C87	.18	500	RCM20B186K	1669-00003		22R5G18			MS-43	Note 6
C88	220	500	RCM20B221K	1669-00025		22R5T22				Note 7
C89	47	500	RCM20B470K	1669-00005		22R5Q47			MS-45	
C90	82	500	RCM20B820K			22R5Q82				
C91	.047	400	RCP10M4473M	P488-047	DF-503	CUB4S47		PT4147	47M-S47	
C92	.47	400	RCP10M4474M	P488-47		CUB4P47		PT4047	47M-P47	
C93	.047	200	RCP10M2473M	P288-047	DF-503	CUB2S47		PT6147	37M-S47	
C94	.022	200	RCP10M2223M	P488-022	DF-203	CUB4S22	617-03	PT4123	47M-S22	
C95	330	500	RCM20B331K	1669-00035		SR5733				
C96	.01	400	RCP10M4103M							
C97	.1	400	RCP10M4104M	P488-1	DF-104	CUB4P1		PT401	47M-P1	
C98	820	500	RCM20B821K							
C99	.0022	400	RCP10M4223M	P488-0022	D6-222	CUB4D23	GP2-333-222	PT4323	67M-D22	
C100	.1	400	RCP10M4104M	P488-1	DF-104	CUB4P1		PT401	47M-P1	
C101	1000	1000	47X569							
C102	.047	400	RCP10M4473M	P488-047		CUB4S47		PT4147	47M-S47	
C103	.047	400	RCP10M4473M	P488-047		CUB4S47		PT4147	47M-S47	
C104	500	30000	47X567		TV8-503	MMU30S5				
C105	.1	400	RCP10M4104M	P488-1	DF-104	CUB4P1		PT401	47M-P1	
C106	10000		47X615	BPD-01	DD-103	K063	81L-01	DC-511	5HK-61	
C107	10000		47X615	BPD-01	DD-103	K063	81L-01	DC-511	5HK-61	

Note 5. Some models use 40MFD in this application.
Note 6. Chassis not marked with orange paint on rear use 36MMF in this application.
Note 7. C88 used only in chassis marked with orange paint on rear of chassis.
† Items C75A, C75B, C75C, R75A, R75B, R75C are combined in one unit.
When replacing items separately C72B and C72C should total 250MMF.
♦ Items C75A, C75B, C75C, R76A, R76B, R76C are combined in one unit.

CONTROLS

ITEM No	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA Wells-Gardner PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R82A	1200Ω		B7EX18D		RTV-485	F1-7	UT152R	Contrast-Panel
B	1 Meg	½				RS-107	UR16-T25	Volume Rear-tapped at 200K
C	Switch					KB-3	UB-37	Attach to R82B
R83A	50KΩ	½	B40X376	Q11-123	A47-50K-S	AB-31	U-35	Horiz. Hold
B	Shaft		Not Req.	Not Req.	FS2-1/4	AK-4	Not Req.	Attach to R83A
R84A	8000Ω	½	B40X375	Q11-118	A47-10K-S	AB-14	SU-20	Vert. Linearity
B	Shaft		Not Req.	BQ	FS2-1/4	AK-1	Not Req.	Attach to R84A
R85A	1. 5Meg	½	B40X373	Q11-138	A47-1.5Meg-S	AB-75	U-155	Tone
B	Shaft		Not Req.	Not Req.	KS2-3	AK-4	Not Req.	Attach to R85A
R86A	100KΩ	½	B40X372A	Q11-128	A47-100K-S	AB-60	U-41	Brightness
B	Shaft		Not Req.	Not Req.	KS2-3	AK-4	Not Req.	Attach to R86A
R87A	2. 5Meg	½	B40X369A	Q11-239	A47-2.5Meg-S	BX-88	SU-585	Height
B	Shaft		Not Req.	BQ	FS2-1/4	Not Req.	Not Req.	Attach to R87A
R88A	1. 5Meg	½	B40X373	Q11-138	A47-1.5Meg-S	AB-75	U-155	Vert. Hold
B	Shaft		Not Req.	Not Req.	KS2-3	AK-4	Not Req.	Attach to R88A
R89A	50KΩ	½	B40X376	Q11-123	A47-50K-S	AB-31	U-35	Horiz. Drive
B	Shaft		Not Req.	Not Req.	KS2-3	AK-4	Not Req.	Attach to R89A

L. F. ... ST.
D. ...

PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA Wells-Gardner PART No.	REPLACEMENT DATA IRC PART No.	NOTES
R70	68KΩ	½		BTS-68K	
R71	10 Meg	½	B85106	BTS-10Meg	
R72A	470KΩ	½	† 76X5	BTS-470K	
B	470KΩ	½		BTS-470K	
R73	47KΩ	½	B85473	BTS-47K	
R74	330Ω	1	C84331	BTA-330	
R75	1000Ω	2	D84102	BTB-1000	
R76A	22KΩ	½		BTS-22K	
B	8200Ω	½	♦ 76X7	BTS-8200	
C	8200Ω	½		BTS-8200	
R77	3300Ω	½	B84332	BTS-3300	
R78	1.5Meg	½	B84155	BTS-1.5Meg	
R79	1.5Meg	½	B84155	BTS-1.5Meg	
R80	180KΩ	½	B84184	BTS-180K	
R81	2.2Meg	½	B84225	BTS-2.2Meg	
R82	15KΩ	½	B84153	BTS-15K	
R83	1.8Meg	½	B84185	BTS-1.8Meg	
R84	820Ω	2	D84821	BTB-820	
R85	3300Ω	1	C84332	BTA-3300	
R86	2200Ω	½	B84222	BTS-2200	
R87	10KΩ	½	B85103	BTS-10K	
R88	100KΩ	½	B85104	BTS-100K	
R89	22KΩ	½	B84223	BTS-22K	
R90	1.2Meg	½	B84125	BTS-1.2Meg	
R91	220KΩ	½	B84224	BTS-220K	
R92	330Ω	½		BTS-330	
R93	330Ω	½		BTS-330	
R94	5600Ω	½	B85562	BTS-5600	

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA Wells-Gardner PART No.	REPLACEMENT DATA IRC PART No.	NOTES
R95	820KΩ	½	B84824	BTS-820K	Note 2
R96	10KΩ	1	C84103	BTA-10K	Note 3
R97	3300Ω	½	B84332	BTS-3300	
R98	330KΩ	½		BTS-330K	
R99	82KΩ	½	B84823	BTS-82K	
R100	150KΩ	½		BTS-150K	
R101	330KΩ	½		BTS-330K	
R102	8200Ω	½	B84822	BTS-8200	
R103	3900Ω	½	B84392	BTS-3900	
R104	120KΩ	½	B84124	BTS-120K	
R105	47KΩ	½	B85473	BTS-47K	
R106	820KΩ	½		BTS-820K	
R107	82KΩ	½	B84823	BTS-82K	
R108	82KΩ	½	B84823	BTS-82K	
R109	82KΩ	1	C84823	BTA-82K	
R110	470KΩ	½		BTS-470K	
R111	1000Ω	½	B85101	BTS-100	
R112	150Ω	5	43X280	PW7-150	
R113	47Ω	½	B85470	BTS-47	
R114	22KΩ	2	D84223	BTB-22K	
R115	18KΩ	2	D84183	BTB-18K	
R116	3.9Ω	1	43X251		
R117	1 Meg	½	C85105	BTS-1 Meg	
R118	7500Ω	5	43X284	1 3/4A-7500	
R119	1000Ω	15	43X281	2D-1000	
R120	160Ω	10	43X282		
R121	100KΩ	2	D85104	BTB-100K	
R122	270KΩ	½	B85274	BTS-270K	

† Items R72A, R72B, C72A, C72B, C72C are combined in one unit.
♦ Items R76A, R76B, R76C, C75A, C75B, C75C are combined in one unit.
Note 2. Chassis not marked with orange paint on rear use 3900Ω in this application.
Note 3. Chassis not marked with orange paint on rear use 4700Ω in this application

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	Wells-Gardner PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	RCA TYPE No.	Halldorson PART No.	Thordarson PART No.
T1	117VAC @ 2.16A	554VCT .300ADC	5VAC @ 6A	53X336	P-8167①②				P9739①②	
	SEC. 3	SEC. 4	SEC. 5							
	6.3VAC @ 11.3A									

① Drill new mounting hole.
② Parallel and phase 6.3V @ 4.5A and 8.5A windings for Sec. # 3.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	Wells-Gardner PART No.	Halldorson PART No.	Merit PART No.	RCA PART No.	Ram PART No.	Stancor TYPE No.	Thordarson PART No.	Triad PART No.
T2	Vert. Osc. Trans.	54X9	B6702	A-3003	209T1①	V405	A-8125	24A87①	A-97X
T3	Horiz. Output Trans.	53X338⑩	FB411 *	HV0-9 *	230T1 *	X080 *	A-8232*②	FLY-8*②	D-19 *
T4	Vert. Output Trans.	51X156	Z1806	A-3039	226T1	V312	A-8141	26S54	A-104X
T5A	Yoke-Horiz. (13MH)	9A2327-2③	DF602④	MDF-72④	209D1④	Y70F14/43④	DY-9A④	Y-4④	Y-17④
B	Vert. (38MH)								
T6	Horiz. Linearity (1.4-8MH)	9A2293		MWC-6⑤	213R1	201R15	WC-8	WC-18⑤	WC-12⑥
T7	Width (3.8-28MH)	9A2292	RF800⑦⑧	MWC-1⑦⑥	215R1⑦	201R10⑦	WC-5⑥⑦	WC-20⑦⑨	WC-11⑥⑦

① Drill one new mounting hole.
② Drill new mounting holes.
③ Includes R92, R93 and eight prong male plug.
④ Use original yoke network.
⑤ Enlarge mounting hole.
⑥ Connect to coded blue and red terminals.
⑦ Use original slider and core or drill new mounting hole.
⑧ Connect to coded #1 and #2 terminals.
⑨ Connect to coded #3 and #4 terminals.
⑩ Early productions use part #53X337 which is now obsolete when replacing with part #53X338. Remove two 83MMF capacitors from yoke socket and connect 5600Ω resistor to center-tap of horizontal winding as shown on schematic.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

	ORIGINAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	RCA Replacement Connections	Ram Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
	9	9	9	9	9	2	2	9
	8	8	8	8	Jumper 8 & 7	Jumper 7 & 5	4	Jumper 8 & 7
	7	5	5	5	5 or 4	7 & 5	8	5
	6	⑪	⑪	⑪	⑪	4	7	⑪
	4	4	4	4	T	4	7	4
	T	T	T	T	T or 3	6	6	T
	3	3	3	3	3	6	6	3
	1	1	1	1	1	8	5	1
Connect Width Coil Across →	3 & 1	3 & 1	3 & 1	3 & 1	3 & 1	6 & 8	6 & 5	3 & 1
Special Notes →		⑪	⑪	⑪	⑪			⑪

⑪ Connect a 56MMF Cap. from terminal #5 to open end of R94 (original terminal #6 connection).

PROPERTY OF
L. F. BLANKE
3924 MEADE
DENVER, COLORA

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	Wells-Gardner PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	
T8	5.2KΩ	3.4Ω	51X65A	A-3849	A-3019	S-5Z	Z1006	26S49	

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	Wells-Gardner PART No.	JENSEN PART No.	QUAM PART No.	
SP1	8"	PM	3.4Ω	12A518	ST-115 Mod. P8-V	8A21	

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	Wells-Gardner PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L34	Horiz. Osc.	80Ω		9A2294	20-1401	TV-161	6182	Waveform winding 55Ω
L35	RF Choke	.8Ω		35A11	19-1000		4602	1 Microhenry; IRC Part No. CLA

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA					
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ∿)	Wells-Gardner PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.
L36	.300ADC	43Ω	1.76HY	52X94	C-2326	C-2996	C-17X	C5037	26C44 ①

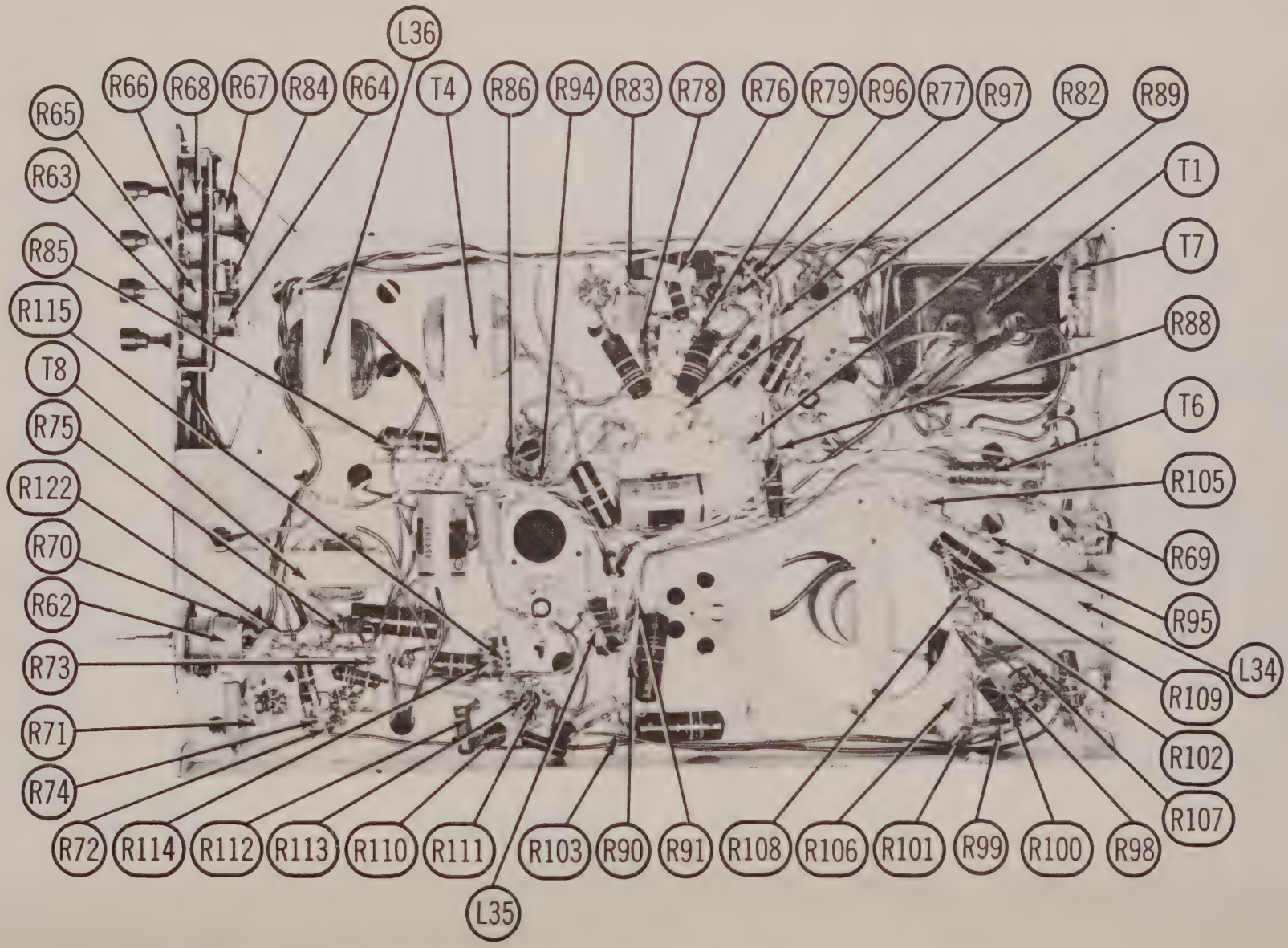
① Drill one new mounting hole.

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			Wells-Gardner PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	3AG Slo-Blo	4/10 A 125V	16X147-3	16X146	313.400 (4/10A-3AG Slo-Blo)	357001	MDL 4/10	4405

MISCELLANEOUS

ITEM No.	PART NAME	Wells-Gardner PART No.	NOTES
M6	Focus Magnet	2A438	Includes centering device
M7	Ion Trap	2A407	
B3	Trimmer	17A268	6-75MMF (Horiz. Locking Range)
	Knob	10A826	Red- Secondary Controls (4 used)
	Knob	10A827-2	Red - Fine tuning
	Knob	10A831-1	Contrast
	Knob	10A830-1	On/off/volume
	Knob	10A828-1	Channel Selector - VHF
	Knob	10A839-1	Channel Selector - UHF
	Safety Glass	17X180	
	Mask	4X1230-1	



SWEEP CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

PROPERTY OF
L. F. BLANKENSHIP
3914 MEADE ST.
DENVER, COLORADO

TROUBLE SHOOTING AIDS (cont)

POWER

DEAD SET

If filaments fail to light check AC interlock assembly. Check switch on volume control and T1. If filaments light check by substitution V23 and V24. Check M1 fuse. Check B+ filter and decoupling network for component failure or change of value.

SMALL AND/OR DIM PICTURE

Check by substitution V23 and V24. Check B+ filter and decoupling network.

HIGH VOLTAGE

LOSS OF HIGH VOLTAGE

Check by substitution V19, V20, V21 and V22. Check waveform W16.

If Satisfactory	If Unsatisfactory
Check T3, T5A, T6, T7, R114, R115, C100, C103, C102 and other associated components.	Check L34, R105, R63, R104, R109, C98, C96, C93 and other associated components.

INSUFFICIENT HIGH VOLTAGE

Check by substitution V20, V21, V22, V23 and V24. Check C99, C66, R114, R115, R109 and other associated components.

BLOOMING

Check by substitution V20, V21, V22, V23 and V24. Check C99, R117, R112, C66 and other associated components.

GENERAL

RASTER, SOUND, NO PICTURE

Follow procedure outlined under "Loss of Video".

RASTER, PICTURE, NO SOUND

Follow procedure outlined under "Weak or No Sound".

RASTER, NO SOUND, NO PICTURE

Check by substitution V2, V3, V4, V5, V6, V7, V8 and V9. Check video IF components for failure or change of value.

NO RASTER, NO SOUND

Follow procedure outlined under "Dead Set".

KEYSTONE EFFECT

Check T5 and its associated components.

INTERMITTENT STREAKS

Check high voltage section for corona discharge and arcing.

Symptoms shown are assumed and are not indicative of the quality and workmanship of this equipment.

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustment of the VHF tuner oscillator circuit may be accomplished as follows:

1. Set the selector knob to VHF position.
2. Tune in a TV station and set the fine tuning control to the center of its range.
3. Remove the channel selector and fine tuning knobs.
4. Adjustments are accessible one at a time thru the small hole above and slightly to the left of the channel switch shaft.

To adjust the UHF oscillator, set the channel selector knobs to the desired UHF channel. The fine tuning knob should be at the center of its range. Remove knobs and adjust the oscillator slug, thru the same hole as for VHF adjustments.

If two UHF channels are received and use the same UHF coil strips, the oscillator should be set for the channel closest to the center of the group.

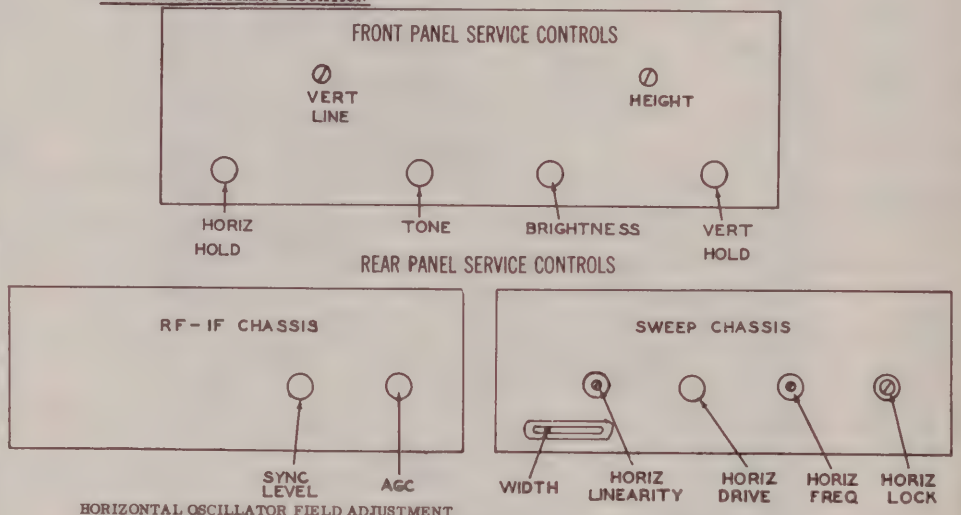
PICTURE TUBE SAFETY GLASS CLEANING

To clean safety glass, remove 5 wood screws holding metal strip at top of safety glass. Remove metal strip and safety glass. (Use extreme caution when removing safety glass).

PICTURE TUBE REMOVAL

For picture tube removal it is necessary to remove chassis. (See disassembly instructions).

SERVICE ADJUSTMENT LOCATION



HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Adjustment of the Horiz. Oscillator Circuit can be made from the rear panel of the chassis. Set the Horiz. Hold Control at the Mid-position of its range and adjust the Horiz. Frequency slug (L34) until the picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate sound IF detector buzz, adjust the ratio detector secondary (L33) located on top of chassis. (See tube placement chart).

FUSES

One fuse is used for L.V. power protection. (For location see tube placement chart).

CENTERING

Centering is accomplished mechanically by means of a centering lever on the PM focusing assembly. Adjust the centering lever from side to side, and up and down until the picture is properly centered.

DISASSEMBLY INSTRUCTIONS

1. Remove 5 push-on type control from front panel.
2. Remove 2 wood screws and 2 metal screws. Remove rear cover.
3. Loosen 2 wood screws from each of the 2 antenna brackets. Remove brackets.
4. Disconnect speaker leads.
5. Remove 4 speaker nuts. Remove speaker.
6. Disconnect grounding leads (2) from yoke and between chassis.
7. Disconnect deflection yoke from chassis, hi-voltage lead, picture tube socket.
8. Disconnect chassis interconnecting cable.
9. Disconnect shielded audio lead from RF chassis, dial light leads (2), and lead from picture tube socket to RF chassis.
10. Remove 5 chassis bolts from RF chassis. Remove RF chassis.
11. Remove 5 chassis bolts from deflection chassis. Remove deflection chassis.

PROPERTY
L. F. BLA
DENV

WESTINGHOUSE MODELS
H-405P5, H-406P5 (Ch. V-2156-2)

WESTINGHOUSE MODELS
H-405P5, H-406P5 (Ch. V-2156-2)

WESTINGHOUSE MODELS
H-405P5, H-406P5 (Ch. V-2156-2)

TRADE NAME	Westinghouse Models H-405P5, H-406P5 (Ch. V-2156-2)
MANUFACTURER	Westinghouse Electric Corp., TV-Radio Div., Metuchen, N. J.
TYPE SET	Three Power Portable AM Superheterodyne Receiver
TUBES (Five)	Types 1U4 RF Amp., 1R5 Conv., 1U4 IF Amp., 1U5 Det-AVC-AF Amp., 3V4 Output
POWER SUPPLY RATING	110-120 Volts AC-DC (or) 9 Volts "A" Supply & 90 Volts "B" Supply In Pack Form .15 Amp. @ 117 Volts AC (or) 55MA @ 9 Volts DC & 17.5MA @ 90 Volts DC
TUNING RANGE—BROADCAST	540KC - 1625KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1	200MMF	High side to pin 6 (grid) of 1R5 (V2). Low side to chassis.	455KC (400~ Mod.)	Tuning gang fully open.	Across voice coil.	A1, A2 A3, A4	Adjust for maximum output. If AC power is used without an isolation transformer, reduce dummy antenna to 200MMF to reduce hum modulation.
2	"	High side to antenna stator lug of tuning gang. Low side to chassis.	1625KC	"	"	A5	"
3	"	"	1400KC	Tune to 1400KC signal.	"	A6	"
4	"	"	600KC	Tune to 600KC signal.	"	A7	Adjust for maximum output. Repeat steps 3 and 4.
5		Loop	1400KC	Tune to 1400KC signal.	"	A8	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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PARTS LIST AND DESCRIPTIONS

WESTINGHOUSE
MODEL H-405P5 (Ch. V-2156-2)

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA: Westinghouse PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RETMA BASE TYPE	NOTES
V1	RF Amp.	1U4	1U4	6AR	
V2	Converter	1R5	1R5	7AT	
V3	IF Amp.	1U4	1U4	6AR	
V4	Det-AVC-AF Amp.	1U5	1U5	6BW	
V5	Output	3V4	3V4	6RX	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: Westinghouse PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	■80	150	V-6552-2	E4D250					R1105	
B	▲60	150								
C	▲40	150								
D	100	25								
C2	.05	200	RCP10W2503M	P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C3	100		V-10710-5	BPD-0001	DD-101	G042	801-0001	UC-531	5GA-T1	
C4	220		V-10710-2							
C5	10000		V-9863-3	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C6	.1	200	RCP10W2104M	P288-1	DF-104	PJ2P1		PT401	4TM-P1	
C7	5000		V-5596	BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C8	.05	200	RCP10W2503M	P288-05	DF-503	PJ2S5		PT4S5	4TM-S5	
C9A	150		♦V-9703-1	♦PA-102					♦34C4	
B	2000									
C	100									
D	5000									
E	5000									
C10	5000		V-9863-2	BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	Note 1
C11	.047	400	V-10157-4473M	489ZX-047	DF-503	PJ4S47		PT4147	4TM-S47	
C12	.05	400	RCP10W4503M	P488-05	DF-503	CUB4S5		PT415	4TM-S5	
C13	.05	200	RCP10W4503M	P488-05	DF-503	CUB4S5		PT415	4TM-S5	Note 2

♦ Items C9A, C9B, C9C, C9D and C9E are combined in one unit.
Note 1: Some versions may use a .002MFD in this application.
Note 2: Not used in all versions.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: Westinghouse PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500KΩ	½	V-9993N-11	Q13-133	A47-500K-Z	BSK-60-S	U-48	Volume
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	76-2	SWE-20	Not Req.	US-27	Attach to R1A

RESISTORS

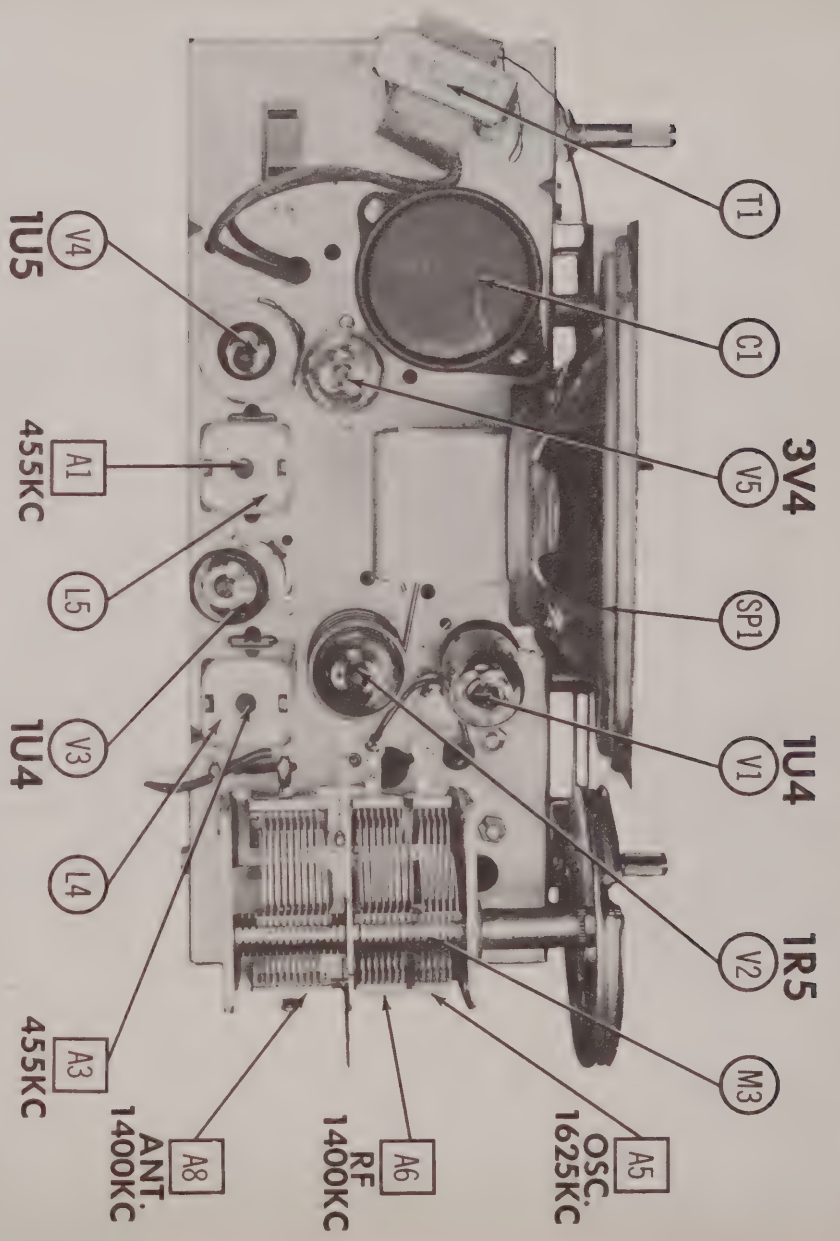
ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: Westinghouse PART No.	REPLACEMENT DATA: IRC PART No.	NOTES
R2	22KΩ	½	RC20AE223K	BTS-22K	
R3	1Meg	½	RC20AE105M	BTS-1Meg	
R4	100KΩ	½	RC20AE104M	BTS-100K	
R5	22KΩ	½	RC20AE223K	BTS-22K	
R6	6.8Meg	½	RC20AE685W	BTS-6.8Meg	
R7	6.8Meg	½	RC20AE685M	BTS-6.8Meg	
R8	10Meg	½	RC20AE106M	BTS-10Meg	
R9	1.5Meg	½	RC20AE155M	BTS-1.5Meg	
R10	470KΩ	½	RC20AE474M	BTS-470K	

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: PART No.	REPLACEMENT DATA: IRC PART No.	NOTES
R11	2.2Meg	½	RC20AE235M	BTS-2.2Meg	
R12	2200Ω	½	RC20AE222K	BTS-2200	
R13	1000Ω	½	RC20AE102K	BTS-1000	
R14	1000Ω	½	RC20AE102K	BTS-1000	
R15A	1000Ω	5	V-5659-5		
B	1000Ω				
R16	82Ω	3	V-6067-9		
R17	1000Ω	1	RC30AE102K	BTA-1000	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE: PRI.	IMPEDANCE: SEC.	REPLACEMENT DATA: Westinghouse PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	NOTES
T1	9.7KΩ	3.3Ω	V11754A-1		A-2927				

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	Westinghouse PART No.	JENSEN PART No.	QUAM PART No.	
SP1	5"	PM	3. 3Ω	V9705	ST-105 Mod. P5-X	5A1	

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	Westinghouse PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Ant. Coil	. 6Ω		V-10921-2				
L2	RF Coil	15Ω *		V-11755-1				
L3	Osc. Coil	2. 4Ω	15Ω	V-5661				
L4	Input IF	22Ω	22Ω	V-6972-6	16-6758	BC-352	12-C1	
L5	Output IF	17Ω	17Ω	V-6972-5	16-6758	BC-353	12-C2	

* Tapped at 3Ω.

SELENIUM RECTIFIER

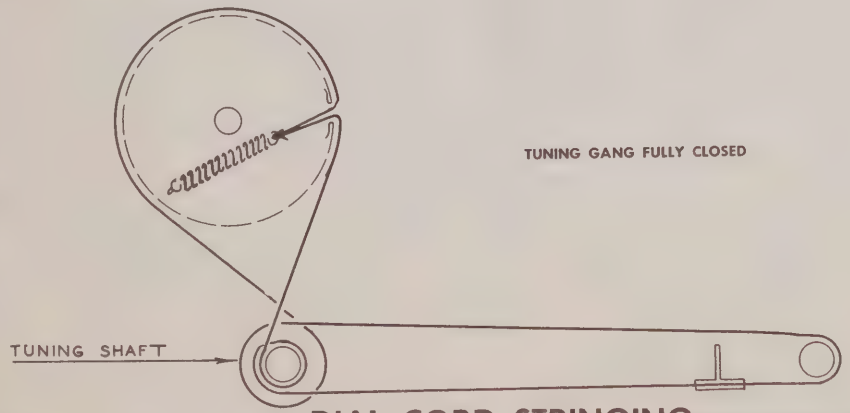
ITEM No.	RATING	REPLACEMENT DATA						NOTES
	CURRENT	Westinghouse PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	SARKES TARZIAN PART No.	SELETRON PART No.	
M1	. 07lA	V9446-2	1003A	RS75	6S75	75	5M4	

BATTERIES

ITEM No.	VOLTAGE	Westinghouse PART No.	REPLACEMENT DATA						INSTALLATION NOTES
			EVEREADY			BURGESS			
			"A"	"B"	"A-B"	"A"	"B"	"A-B"	
M2	9V "A" 90V "B"				756			T6Z60	

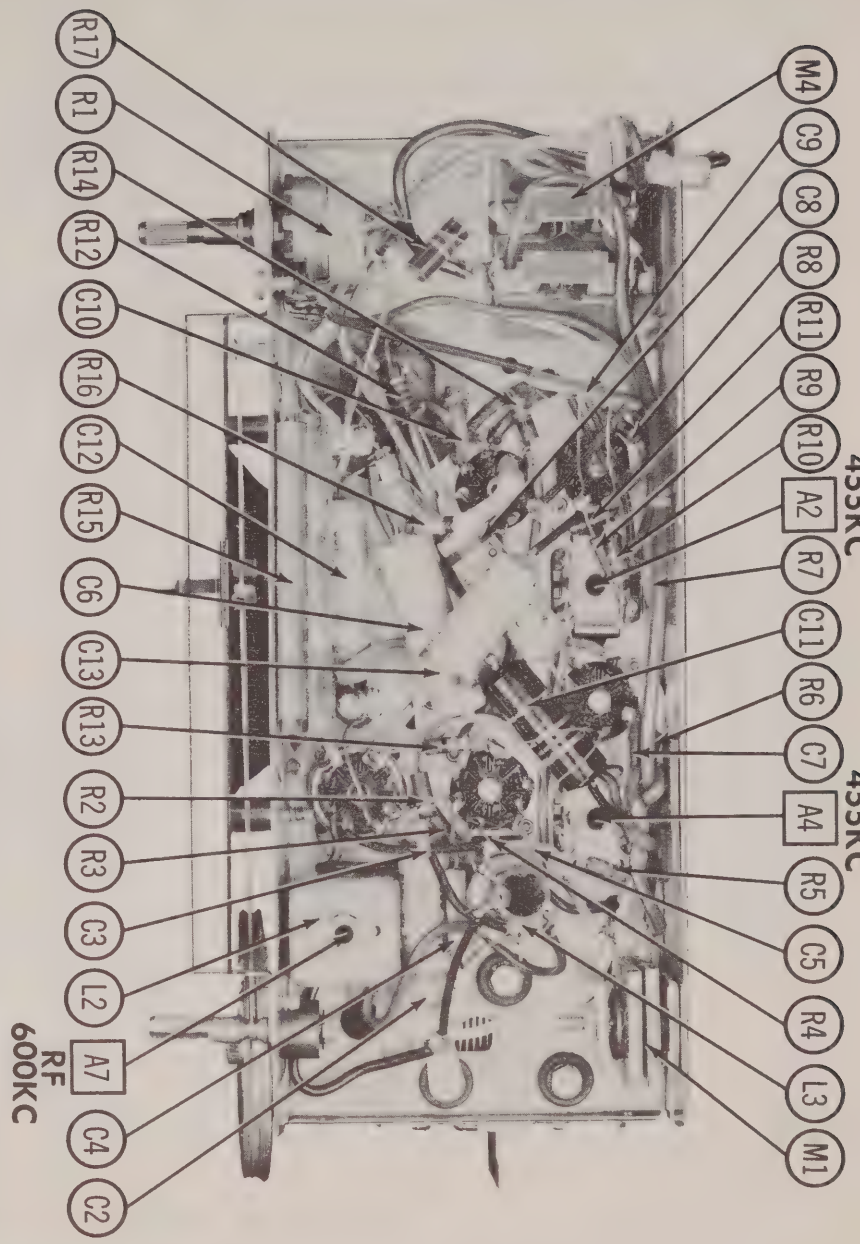
MISCELLANEOUS

ITEM No.	PART NAME	Westinghouse PART No.	NOTES
M3	Tuning Cap.	V-6552-2	21-315MMF; 15-240MMF; 6-105MMF.
M4	Switch	V-6565	Changeover
	Cabinet	V-1297-1	Model H-405P6 (Less handle)
	Cabinet	V-1297-2	Model H-406P5 (Less handle)
	Handle	V-11761-1	Model H-405P5
	Handle	V-11761-2	Model H-406P5
	Knob	V-11762-1	On-Off-Volume
	Knob	V-11762-2	Tuning
	Dial	V-11760-1	
	Pointer	V-11732-1	



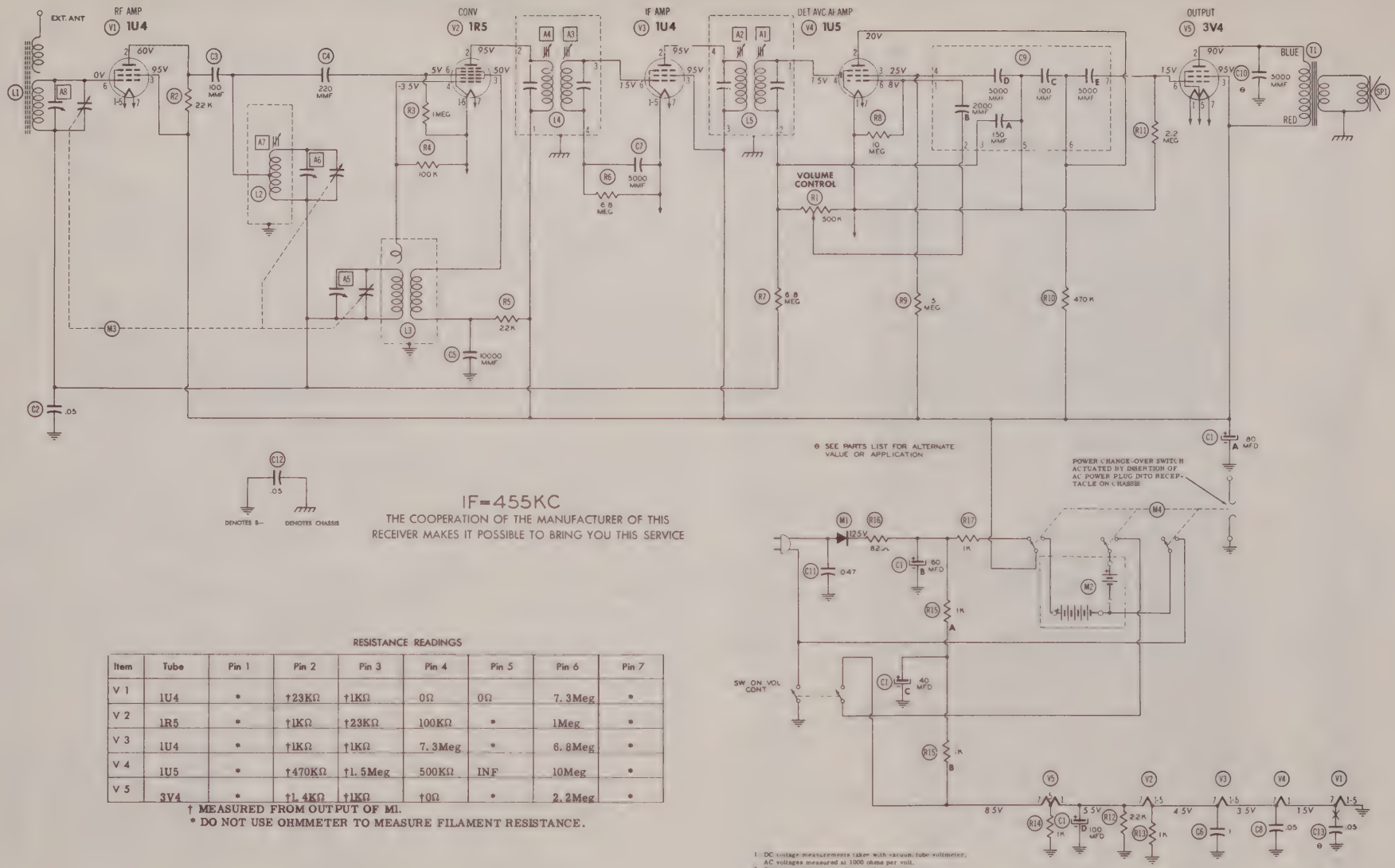
DIAL CORD STRINGING

CHASSIS—BOTTOM VIEW



WESTINGHOUSE
MODEL H-405P5 (Ch. V-2156-2)

WESTINGHOUSE
MODEL H-405P5 (Ch. V-2156-2)



⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

IF=455KC

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	1U4	*	†23KΩ	†1KΩ	0Ω	0Ω	7. 3Meg	*
V 2	1R5	*	†1KΩ	†23KΩ	100KΩ	*	1Meg	*
V 3	1U4	*	†1KΩ	†1KΩ	7. 3Meg	*	6. 8Meg	*
V 4	1U5	*	†470KΩ	†1. 5Meg	500KΩ	INF	10Meg	*
V 5	3V4	*	†1. 4KΩ	†1KΩ	†0Ω	*	2. 2Meg	*

† MEASURED FROM OUTPUT OF M1.
* DO NOT USE OHMMETER TO MEASURE FILAMENT RESISTANCE.

1. DC voltage measurements taken with vacuum tube voltmeter, AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views
3. Measured values are from socket pin to common negative
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings
6. Volume control at maximum, no signal applied for voltage measurements

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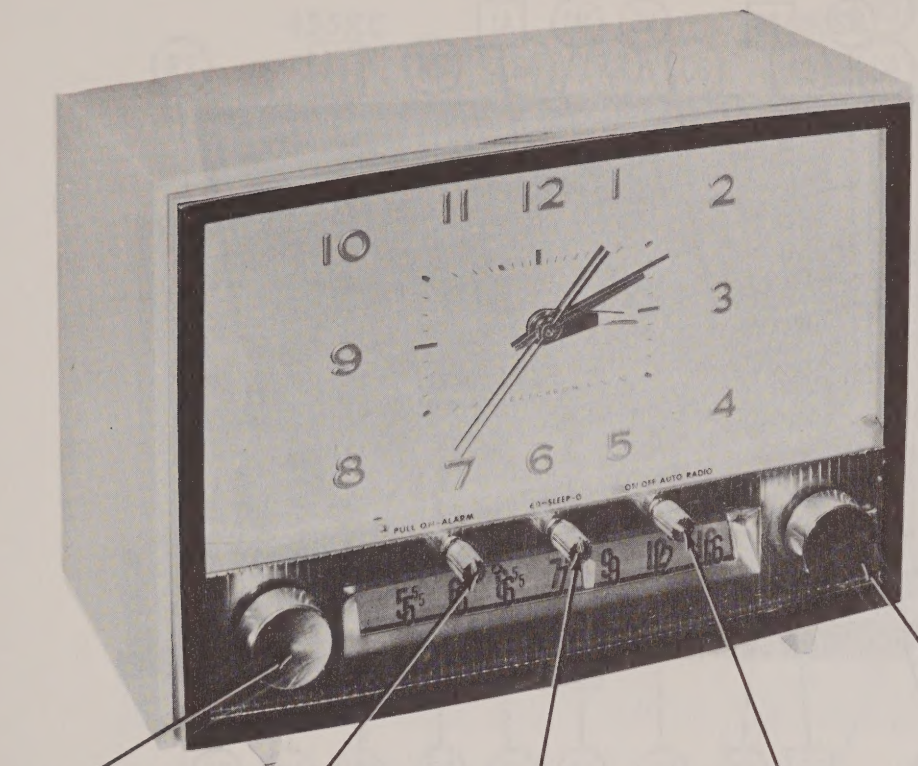
WESTINGHOUSE MODELS H-475T5, H-476T5, H-477T5, H-478T5 (Ch. V-2236-1)

WESTINGHOUSE MODELS H-475T5, H-476T5, H-477T5, H-478T5 (Ch. V-2236-1)



WESTINGHOUSE MODELS H-475T5, H-476T5, H-477T5, H-478T5 (Ch. V-2236-1)

TRADE NAME	Westinghouse Models H-475T5, H-476T5, H-477T5, H-478T5 (Ch. V-2236-1)
MANUFACTURER	Westinghouse Electric Corp., TV-Radio Div., Metuchen, N. J.
TYPE SET	AC Operated AM Superheterodyne Receiver With Electric Clock
TUBES (Five)	Types 12BE6 Conv., 12BA6 IF Amp., 12AV6 Det-AVC-AF Amp., 50C5 Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC - 60 Cycles
RATING	.27 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	540KC - 1625KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1	200MMFD	High side to antenna stator lug of tuning gang. Low side to chassis.	455KC (400~ Mod)	Tuning gang fully open.	Across voice coil.	A1, A2 A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2	"	"	1625KC	"	"	A5	"
3		Loop	1400KC	Tune to 1400KC signal.	"	A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

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PARTS LIST AND DESCRIPTIONS

WESTINGHOUSE
MODEL H-475T5 (Ch. V-2236-1)

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		Westinghouse PART No.	STANDARD REPLACEMENT		
V1	Converter	12BE6	12BE6	7CH	
V2	IF Amp.	12BA6	12BA6	7BK	
V3	Det-AVC-AF Amp.	12AV6	12AV6	7BT	
V4	Output	50C5	50C5	7CV	
V5	Rectifier	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	Westinghouse PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	50	150	V-14636-1	PRS150/50-50		BBRD5515		TCD49	TVA-2453	Red
B	50	150								Orange
C2	10000		R2CC63Z5Z103P	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C3	2000		R2CC61Z5Z202P	BPD-002	DD-202	K072	801-002	DC-522	5HK-D2	
C4A	220									
B	5000									
C	5000		♦V-10789-2	♦PA-113-2	♦PC-151	♦116TM2	♦1408-02		♦DT-2	
D	} 250									
E										
C5	10000		R2CC63Z5Z103P	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C6	.047	400	V-10157-4473M	P488-047	DF-503	CUB4S47		PT4147	4TM-S47	
C7	.1	400	RCP10W4104M	P488-1	DF-104	CUB4P1		PT401	4TM-P1	
C8	2000		R2CC61Z5Z202P	BPD-002	DD-202	K072	801-002	DC-522	5HK-D2	

♦ Items C4A, C4B, C4C, C4D, C4E, R5A, R5B and R5C are combined in one unit.
When replacing items seperately, C4D and C4E should total 250MMF.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	Westinghouse PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	500KΩ	½	V-9993-16	Q13-133	A47-500K-Z	B-60	U-48	Volume
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R1A

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	Westinghouse PART No.	IRC PART No.	
R2	22KΩ	½		BTS-22K	
R3	680Ω	½		BTS-680	
R4	3.3Meg	½		BTS-3.3Meg	
R5A	6.8Meg	½		BTS-6.8Meg	
B	470KΩ	½	♦V-10789-2	BTS-470K	
C	470KΩ	½		BTS-470K	

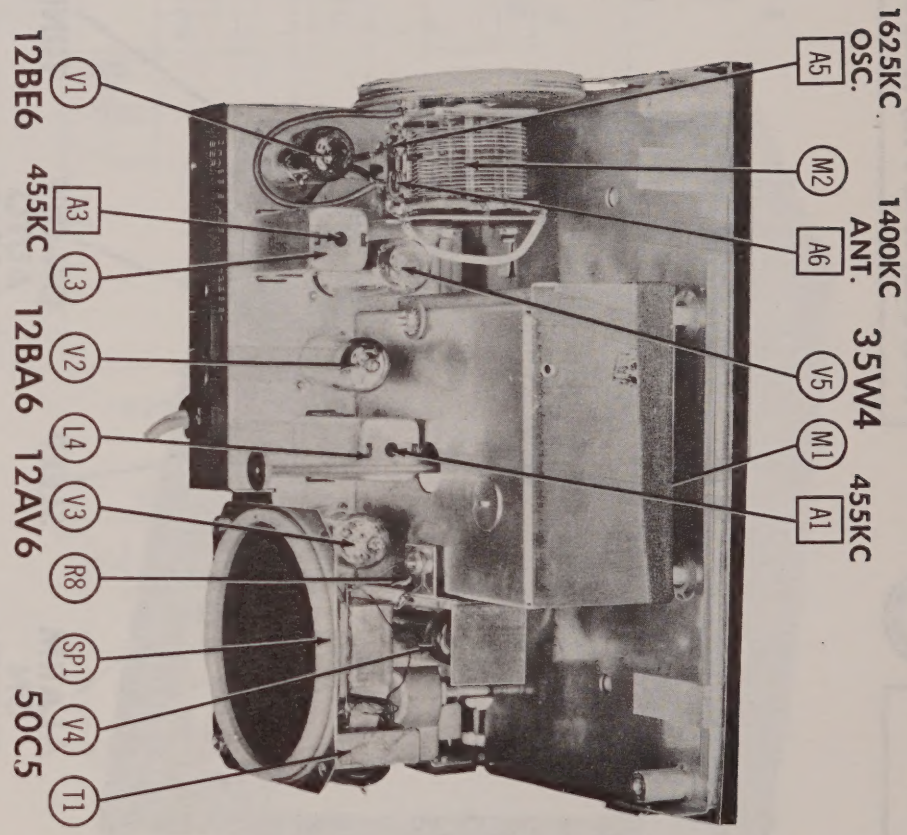
ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	Westinghouse PART No.	IRC PART No.	
R6	150Ω	½		BTS-150	
R7	1000Ω	1		BTA-1000	
R8	220KΩ	½		BTS-220K	Note 1
R9	100KΩ	½		BTS-100K	Note 2
R10	150Ω	½	RC20AE151M	BTS-150	Note 1

♦ Items R5A, R5B, R5C, C4A, C4B, C4C, C4D and C4E are combined in one unit.
Note 1: Not used in some versions.
Note 2: Some versions may use a 220KΩ resistor in this application.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	Westinghouse PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	
T1	2.3KΩ	3.2Ω	V-14645-1	A-3332	A-3025	S-12X	Z1101	26S58	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	Westinghouse PART No.	VIKING PART No.	QUAM PART No.	
SP1	3½"	PM	3.2Ω	V-14747-1	35J6	3A07	

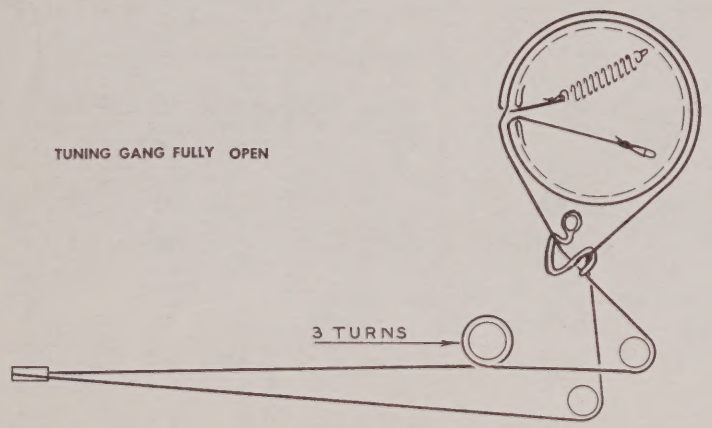
COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	Westinghouse PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Ant. Coil	3.2Ω		V-14641-1				
L2	Osc. Coil	1Ω	11.5Ω	V-14639-1	14-1073 *		69-Osc. ■	
L3	Input IF	16Ω	17Ω	V-10945-1	16-6758	BC-352	12-C1	
L4	Output IF	16Ω	16Ω	V-10945-1	16-6758	BC-353	12-C2	

* Leads sufficient mounting support.
■ Drill mounting hole.

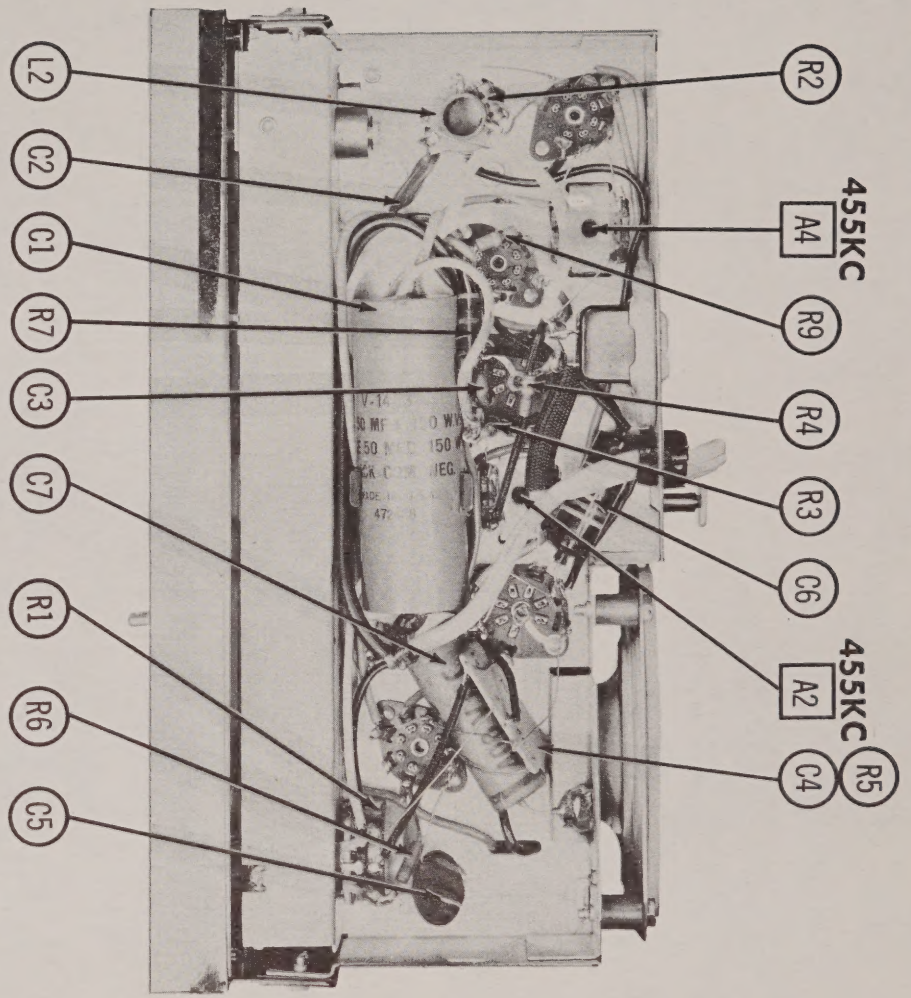
MISCELLANEOUS

ITEM No.	PART NAME	Westinghouse PART No.	NOTES
M1	Neon Lamp	NE 2	
M2	Tuning cap.	V-14637-1	10-210MMF; 16-118MMF.
	Cabinet	V-1376-1	Model H-475T5
	Cabinet	V-1376-2	Model H-476T5
	Cabinet	V-1376-3	Model H-477T5
	Cabinet	V-1376-4	Model H-478T5
	Knob	V-14682-1	Clock - 3 used
	Knob	V-14683-1	Volume & Tuning
	Dial	V-14649-1	Clock Face
	Dial	V-14655-1	Pointer
	Crystal	V-14679-1	Includes Radio Dial Calibration & Clock Nomenclature



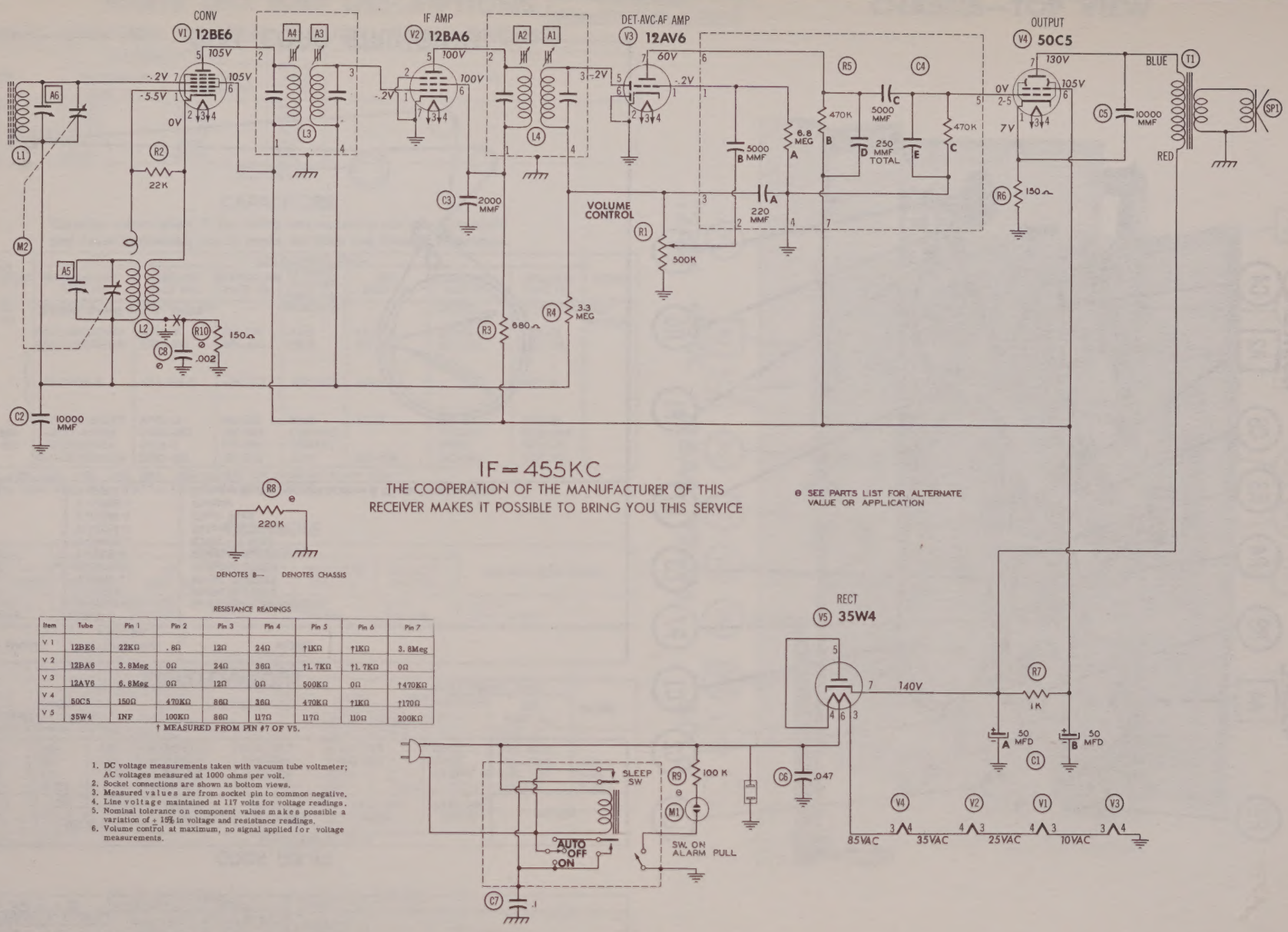
DIAL CORD STRINGING

CHASSIS—BOTTOM VIEW



WESTINGHOUSE
MODEL H-475T5 (Ch. V-2236-1)

WESTINGHOUSE
MODEL H-475T5 (Ch. V-2236-1)



IF = 455KC

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12BE6	22KΩ	.8Ω	12Ω	24Ω	†1KΩ	†1KΩ	3.8Meg
V 2	12BA6	3.8Meg	0Ω	24Ω	36Ω	†1.7KΩ	†1.7KΩ	0Ω
V 3	12AV6	6.8Meg	0Ω	12Ω	0Ω	500KΩ	0Ω	†470KΩ
V 4	50C5	150Ω	470KΩ	86Ω	36Ω	470KΩ	†1KΩ	†170Ω
V 5	35W4	INF	100KΩ	86Ω	117Ω	117Ω	110Ω	200KΩ

† MEASURED FROM PIN #7 OF V5.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

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